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ABSTRACT

The Schools and Staffing Survey (SASS) of the National Center for Education Statistics is an integrated system of surveys of public and private schools, school districts, school administrators, and teachers. This collection contains six papers related to the 1991 SASS and its components or followups in later years. The following papers are included: (1) "The Results of the 1993 Teacher List Validation Study (TLVS)" (Daniel Royce); (2) "Designing the Teacher Followup Survey (TFS): Issue and Content" (David W. Grissmer and Sheila Nataraj Kirby); (3) "Understanding the Supply of Elementary and Secondary Teachers: The Role of the School and Staffing Survey and the Teacher Followup Survey" (Neil D. Theobald and R. Mark Gritz); (4) "Teacher Retention/Attrition: Issues for Research" (Bonnie S. Billingsley); (5) "Reflections on a SASS Longitudinal Study" (Iris R. Weiss); and (6) "Whither Didst Thou Go? Retention, Reassignment, Migration, and Attrition of Special and General Education Teachers in National Perspective" (Erling E. Boe, Sharon A. Bobbitt, and Lynne H. Cook). Each paper contains references. (Contains 1 figure, 6 graphs, and 25 tables.) (SLD)

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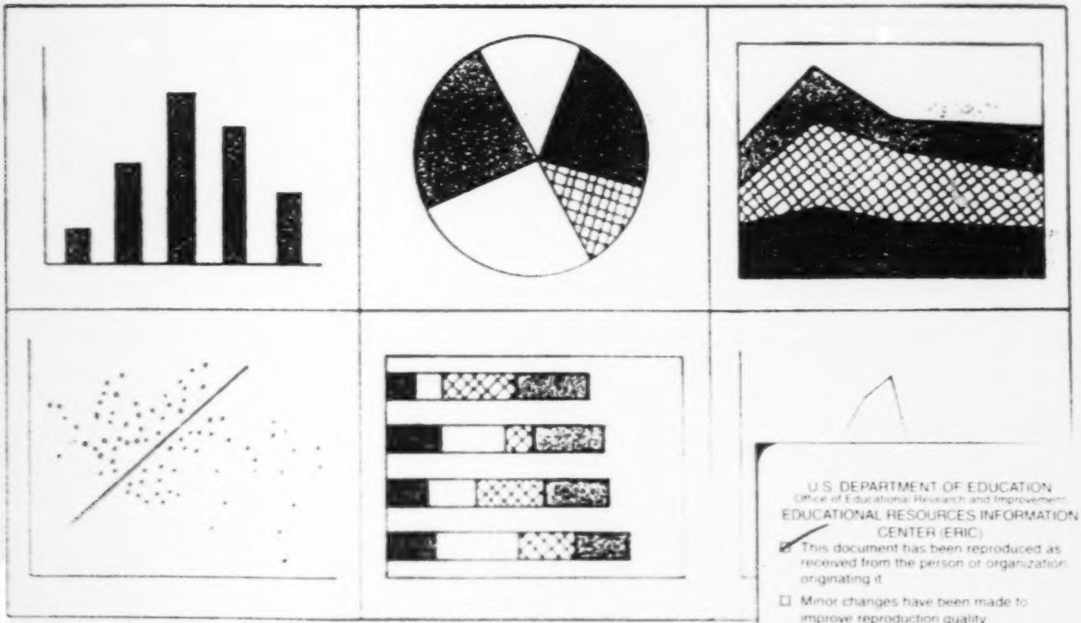
Working Paper Series

Six Papers on Teachers from the 1990-91 Schools and Staffing Survey and Other Related Surveys

Working Paper No. 94-06

July 1994



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Six Papers on Teachers from the 1990-91
Schools and Staffing Survey and Other Related Surveys

Working Paper No. 94-06 -July 1994

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July 1994

Foreword

Each year a large number of written documents are generated by NCES staff and individuals commissioned by NCES which provide preliminary analyses of survey results and address technical, methodological, and evaluation issues. Even though they are not formally published, these documents reflect a tremendous amount of unique expertise, knowledge, and experience.

The ***Working Paper Series*** was created in order to preserve the valuable information contained in these documents and to promote the sharing of valuable work experience and knowledge. However, these documents were prepared under different formats and did not undergo vigorous NCES publication review and editing prior to their inclusion in the series. Consequently, we encourage users of the series to consult the individual authors for citations.

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The Results of the 1993 Teacher List Validation Study (TLVS)

By: Daniel Royce
Quality Assurance and Evaluation Branch
Demographic Statistical Methods Division
June 3, 1994

I. Summary

A. Purpose

We conducted the Teacher List Validation Study to evaluate the quality of our Teacher Listing Record (TLR). This form is used during the Schools and Staffing Survey (SASS) to obtain a list of teachers in each school.

We designed the study to be primarily qualitative in nature. Also, because we selected a non-random sample, we conducted no statistical tests on the results.

B. Major Findings

1. Reinterview and Reconciliation of the TLR

- The data suggest that the public schools were more accurate listing teachers than their corresponding school district (Local Education Agency, or LEA).
- Public schools and LEAs often omitted part-time and specialized subject matter teachers from the TLR. (Attachment B contains a complete description of the teacher groups.)
- LEAs often incorrectly listed guidance counselors, while public schools most often erroneously listed librarians and speech therapists as teachers.
- Although the private schools incorrectly included non-teachers and incorrectly excluded teachers, the instances were few in each teacher/non-teacher group.

2. TLR vs. School Questionnaire

- The data suggest that both the public and private schools were more accurate listing teachers using the TLR than the school questionnaire (SASS-3X).
- The public and private schools often omitted part-time teachers when reporting their teacher count using the school questionnaire.
- The types of non-teachers most often included in error on the SASS-3X by the public and private schools were librarians and pre-k teachers.

C. Recommendations

- Continue to use the public schools, rather than the LEAs, to obtain teacher counts using the TLR. Although the schools were not completely accurate, they were more accurate at listing teachers than their corresponding LEA.

- The schools appeared to provide a more accurate teacher count using the TLR, rather than the school questionnaire. Even though this was the case, the design of the TLR and the instructions need additional research.

  We used the results of this study to revise the TLR for the 1993-94 SASS. It contained more specific instructions regarding who should and should not be included on the list.

  The Center for Survey Methods Research (CSMR) has implemented a program of cognitive research to improve the TLR. The results of this research will be available in the fall of 1994.

II. Methodology

During the SASS, the TLR is used to obtain a list of teachers in each school. The Census Bureau then selects a sample of teachers from each school for the teacher survey portion of SASS.

The study was prompted by the fact that both the 1987-88 and 1990-91 SASS estimated different numbers of teachers using the TLR compared with the school questionnaire. In the 1987-88 SASS, the schools, on average, reported fewer teachers on the TLR compared to the school questionnaire. In the 1990-91 SASS, the schools reported different numbers of teachers on these two forms. The TLR is always mailed to the schools at the beginning of the fall semester. The school questionnaire (in the 1987-88 and 1990-91 SASSs) was mailed to the schools in the beginning of the spring semester.

The study contained two components, each with different objectives. The objectives for component 1 were to:

1) determine if the schools filled out the TLR per our instructions (i.e., the instructions printed on the form),

2) determine if the schools listed eligible in-scope teachers,

3) determine if the school districts (Local Education Agencies, or LEAs), rather than the public schools, could provide more accurate listings of teachers.

The objective of component 2 was to determine whether the school questionnaire or the TLR produced a more accurate count of teachers in the school. The assumption was that the counts from the school questionnaire are more accurate.

A general objective for both components was to find out if certain types of teachers/non-teachers created problems for the schools when computing the teacher counts (i.e., teachers were systematically missed or included incorrectly and/or their definitions were misunderstood).

A. Component 1: Reinterview and Reconciliation of the TLR

In component 1 we compared the teacher count obtained from the TLR completed by the public school to the one completed by the LEA for that school. For private schools we compared the teacher count on the TLR completed by the school to the teacher count as reported by the school in the 1991-92 PSS[1]. We selected the 200 reinterview cases (100 public and 100 private) with the largest percent differences between the counts.

1. Sample Design

The sample for component 1 consisted of 300 private schools, 290 public schools, and 254 LEAs. (Some LEAs had more than one sample school.) This sample did not overlap with the component 2 sample.

Attachment A contains a more detailed description of the sample.

When we received approximately 85 percent of the TLRs, we began selecting our reinterview samples. (We couldn't wait until we received all of the TLRs to select the reinterview sample because it would have been too late to begin the reinterview.) We selected 100 public schools (with their corresponding LEA) and 100 private schools.

Note: The schools (and LEAs, for public schools) were eligible for reinterview only if they sent in a completed TLR. If either a public school or its LEA did not return a TLR, they were not eligible for the reinterview sample.

---

[1] The PSS refers to the 1991-92 Private School Survey. This survey collects data from private schools on student enrollment, student race/ethnicity, school programs, number of teachers, and type/location/affiliation of school.

a. Public Schools

We matched each public school TLR with its corresponding LEA TLR. We then selected the 100 public schools with the highest difference rate as defined below:

L = number of teachers reported on the **LEA TLR only**
S = number of teachers reported on the **school TLR only**
B = number of teachers reported on **both TLRs**

$$\text{difference rate} = \frac{(L + S)}{(L + S + B)}$$

The difference rates ranged from .87 to 0. The 100 public schools that we selected for reinterview ranged from .87 to .11.

b. Private Schools

We selected the 100 private schools with the highest difference rate (positive or negative) as described below:

S = total number of teachers reported on **school TLR**
P = total number of teachers reported in **the 1991-92 PSS**

$$\text{difference rate} = \frac{(S - P)}{S}$$

The difference rates ranged from 23.5 to 0. The 100 private schools that we selected for reinterview ranged from 23.5 to .18.

Note: Unlike the public schools, we could not consider the actual teachers listed in developing this rate because the PSS only provided counts - not names.

2. Procedures / Timing

In mid-November, 1992, a TLR was mailed to each private school, public school, and each public school's LEA (254 LEAs in all - 290 questionnaires). Telephone nonresponse follow-up for these questionnaires began in the regional offices in mid-December. Closeout was at the end of January, 1993. (This timing was consistent with past SASSs.)

Reinterview began in mid-February, 1993 and ended at the end of March.

The reinterviewers were given no formal training. They were instructed to read the Reinterviewer Instructions Memorandum, and use their overall experience and knowledge on conducting reinterviews. The field representatives that were used were familiar with conducting reinterviews.

Note: The original TLRs were edited in the regional offices. Contrary to what is done normally (i.e., in past SASSs) we decided that if the regions found errors on the TLRs, they should not contact the schools to correct them. Instead, they documented the errors on the TLRs. We hoped to find out the reasons for the errors during the reinterview.

a. Public Schools

Of the 100 public schools selected for reinterview, 50 were conducted by personal visit, and 50 by telephone. The reinterview method was assigned by ranking the 100 cases in order from largest difference rate to smallest, and then alternating, beginning at the top of the list, by personal visit and telephone.

We instructed reinterviewers to contact only the school (not the LEA) for these reinterviews.

i. **50 personal visit cases**

For the 50 personal visit cases, the original school respondent completed another TLR, thinking aloud as he/she filled out the form. Our goal here was to determine how the respondent interpreted our instructions.

Once this was done, we instructed the reinterviewer to compare the reinterview list with the original list filled out by the respondent, and reconcile any differences. The reinterviewer was also instructed to determine why the LEA reported certain teachers that the school did not.

ii. **50 telephone cases**

For the 50 telephone cases, the respondent did not complete another TLR. Instead, the reinterviewer was instructed to reconcile the differences between the TLR filled out by the school and the one filled out by the LEA.

We mailed back to the school a copy of the original TLRs completed by the school and the LEA, along with a letter describing the study and that someone from the Census Bureau would contact them regarding the reconciliation. This was done so that the respondent would have the necessary information when the reinterviewer called.

b. Private Schools

Of the 100 private schools selected for reinterview, 50 were conducted by personal visit, and 50 by telephone. These were assigned by ranking the 100 schools from the largest school (in terms of size, not difference rate) to the smallest. We determined the size of the school by the number of teachers in the school as reported on the original TLR. The larger 50 schools were assigned personal visit reinterviews, while the smaller 50 were assigned telephone reinterviews. We did this because it would be easier to conduct a reinterview for a smaller school over the phone than it would for a larger school. The largest school in the telephone sample contained 11 teachers.

Note: We did not conduct a reinterview for the public school telephone reinterview cases. We reconciled the differences between the school TLR and the LEA TLR. Therefore, it was not necessary to purposely include the smaller sized schools in the public telephone reinterview sample.

i. **50 personal visit cases**

The reinterviewers conducted the 50 personal visit cases the same way as the 50 personal visit cases for public schools. The reinterviewer instructed the school respondent to complete another TLR, thinking aloud as he/she filled out the form.

Once completed, the reinterviewer compared the reinterview TLR with the original TLR filled out by the respondent, and reconciled any differences.

ii. **50 telephone cases**

The 50 telephone cases were done the same way as the 50 personal visit cases. The respondent completed another TLR over the phone. The reinterviewer then reconciled the differences between the original TLR and the reinterview TLR.

B. Component 2: TLR vs. School Questionnaire

In component 2, we compared the teacher count reported by the school on the TLR to the teacher count reported on the school questionnaire. No LEAs were involved in component 2. For the reinterview, we selected 200 cases (100 public and 100 private) with the largest differences between these counts.

1. Sample Design

The sample consisted of 300 private schools and 290 public schools. This sample was selected the same way as the component 1 sample. (See Attachment A.)

We selected the component 2 reinterview sample in two phases. We did this because the school questionnaires came in slower than expected. When we received approximately 50 percent of the school questionnaires, we selected phase one of our reinterview sample. After we received about 90 percent of the school questionnaires, we selected phase two of the reinterview sample. We selected a total of 100 public schools and 100 private schools. We selected the public and private school reinterview samples the same way.

We selected the 100 public schools and 100 private schools with the highest difference rate (positive or negative) as described below:

T = number of teachers reported on **Teacher Listing Record (TLR)**
X = number of teachers reported on **school questionnaire (SASS-3X)**

$$\text{difference rate} = \frac{(T - X)}{T}$$

The difference rates ranged from .98 to 0 for the public schools (.98 to .05 for the 100 public schools selected for reinterview), and from 2.0 to 0 for the private schools (2.0 to .07 for the 100 private schools selected for reinterview).

2. Procedures / Timing

Component 2 began by mailing a TLR to each public school and private school in the Component 2 sample. The timing for this mailing was the same as Component 1. (They were mailed in mid-November, 1992. Telephone nonresponse follow-up began in the regional offices in mid-December, and closeout was at the end of January, 1993. This timing was consistent with past implementations of the SASS.)

At the end of February we mailed a SASS-3(X), school questionnaire to each school in the Component 2 sample. Telephone nonresponse follow-up began at the end of March, and closeout was at the end of May. (This timing was consistent with past implementations of the SASS.)

The SASS-3(X) was a field test version of the school questionnaire. It was being tested in preparation for the 1993-94 SASS. It contained questions about the characteristics of a school. Included in the questionnaire were questions regarding the number of teachers in the school. We were interested in these teacher count questions only.

Reinterview began at the beginning of May, and ended in mid-June.

Each public school and private school reinterview in component 2 was conducted by telephone. We mailed back to the school a copy of the original TLR and school questionnaire filled out by the school, along with a letter describing the study and that someone from the Census Bureau would contact them regarding the reconciliation.. This was done so that the respondent would have the necessary information when the reinterviewer called.

The 100 public school and 100 private school respondents did not complete another TLR (as was done in component 1). Instead, the reinterviewer reconciled the differences between the teacher count reported on the original TLR, and the teacher count reported on the school questionnaire.

C. Determining the Actual Count of Teachers

Before we could do the data analysis, we had to determine the actual count of teachers in each school (i.e., the "truth" count). We used this count as the basis for our comparisons. We did this by:

- reviewing the instructions on how to complete the TLR and school questionnaire
- reviewing the TLR completed by the school (and LEA, for public schools)
- reviewing the reinterview TLRs completed by the schools (component 1 only)
- reviewing the school questionnaire completed by the schools (component 2 only)
- reviewing the explanations and notes provided by the reinterviewer regarding the list of teachers on the TLRs, the count of teachers on the TLRs, and the count of teachers on the school questionnaires
- using the definitions and guidelines that NCES has set up regarding (for our purposes) who is, and who is not a teacher.

D. Limitations

Certain aspects of the study limited us to what we could and did find out.

First of all, this study was designed to be qualitative in nature rather than quantitative. We weren't trying to get specific numbers on how many teachers were erroneously missed or non-teachers that were erroneously included. Rather, we attempted to find out the types of teachers/non-teachers that the schools included or excluded in their counts. For that reason, we did not find out, for example, the exact number of librarians that were being counted as teachers. We did, however, find this out at the school level (i.e., how many schools were including librarians in error).

Second, we wanted to find out reasons why the schools excluded certain teachers and included persons that should not have been included. Unfortunately, the reinterview and reconciliation did not gather adequate reasons. Most of the respondents simply said they "forgot about that person" or "I thought this person should/shouldn't be included." Other respondents simply didn't provide reasons.

Third, our initial sample was not unbiased or random. We purposely wanted in the sample those schools that historically reported (based on past SASSs) inconsistent teacher counts using the TLR and the school questionnaire. (Attachment A describes the sample in more detail.) The reinterview samples also were not unbiased or random.

Because of the way we selected the samples, statistical testing on the results would be inappropriate. Although we do say that certain counts are greater than others, there is no statistical evidence that this is so. We merely "eyeballed" the numbers.

III. Results

The results in this report are shown separately by component (1 and 2). Within each component we show results for public cases and private cases. The component 1 public school cases are also shown separately by telephone reinterview and personal visit reinterview. We do not have separate sections for the private school reinterview telephone and personal visit cases. Other than the method of reinterview, the procedures were the same for these cases. There was also no major procedural difference between the private telephone reinterview cases and the private personal visit reinterview cases.

We compared the counts obtained from the TLRs (components 1 and 2) and school questionnaires (component 2, only) to the actual count of teachers in the school. We used only those cases where we could determine a "truth count". (See table below.) For public schools, we also compared the count of teachers from the CCD[2] to the truth count. For private schools, we compared the count of teachers from the PSS to the truth count in component 2 only. We already know that these counts will differ for the cases in component 1 because we selected this sample based on the large difference between the TLR count and the PSS count.

We discovered that the CCD and PSS counts were not very accurate. This was probably due to the fact that they were not current counts. The CCD counts were from the 1990-91 school year. The PSS counts were from 1991-92.

We also kept track of the different types of teachers that the schools (and LEAs, for public schools) incorrectly EXCLUDED in their TLR and school questionnaire counts, and the different types of non-teachers that were incorrectly INCLUDED in their counts. Attachment B contains the 19 different groups that we used to classify these types of teachers and non-teachers. We used all completed reinterviews for this analysis. (See table on next page.)

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[2] Common Core of Data (CCD) - This file contains public school data provided and updated by the state each year. LEAs provide the schools' data to the state. We used the teacher counts from the 1990-91 CCD file for the 1993 TLVS.

The table below describes the response rates.

	Component 1				Component 2	
	Public		Private			
	Phone	PV[3]	Phone	PV	Public	Private
Total Sample	50	50	50	50	100	100
Complete Reinterviews	50	49	47	48	100	98
Refusals	0	1	2	2	0	0
Unable to Contact	0	0	1	0	0	2
"Truth" Count Determined[4]	50	49	47	48	88	88

A. Component 1: Reinterview and Reconciliation of the TLR

1. Public School - Telephone Reinterview

Of the 50 LEA TLRs, 14 contained the correct number of teachers in the school and 27 were within ± 5 percent of the truth count. Nineteen school TLRs contained the correct count, and 34 were within 5 percent of the truth count. The LEA and school counts (the exact matches and the counts within 5 percent) appear consistent. The data suggest that these counts are, however, greater than the CCD counts (6 exact matches, 16 within 5 percent). See table 1 and graph 1 on next page.

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[3] PV = personal visit reinterview

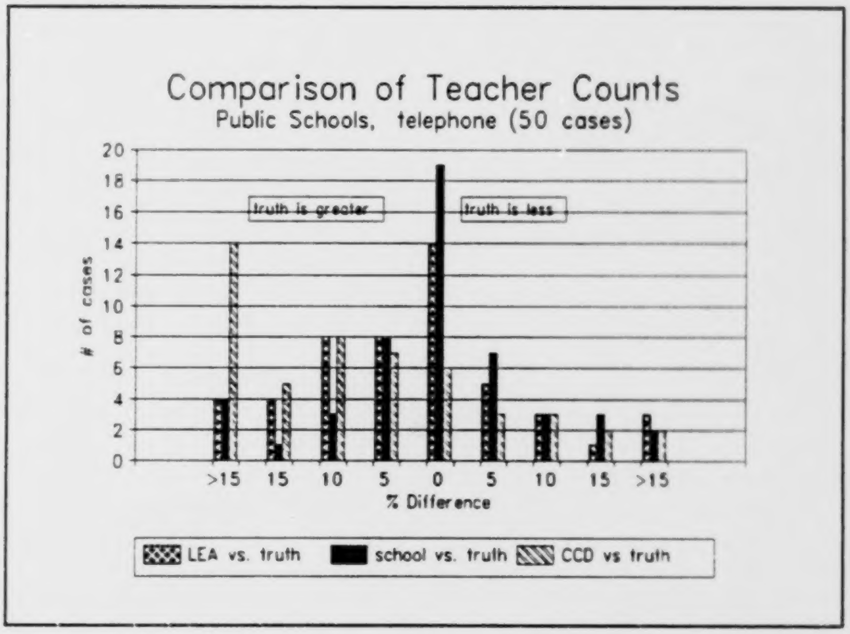
[4] We used these cases for the percent difference analysis.

Table 1 **Distribution of Public Schools/LEAs by Percent Difference from Truth Count**

Source	No. of schools/LEAs					
of Data	0%	$0<P\leq 5$	$5<P\leq 10$	$10<P\leq 15$	$P>15$	total
LEA TLR	14	13	11	5	7	50
school TLR	19	15	6	4	6	50
CCD count	6	10	11	7	16	50

- P = the percent difference from the truth count

Graph 1



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2. Public School - Personal Visit Reinterview

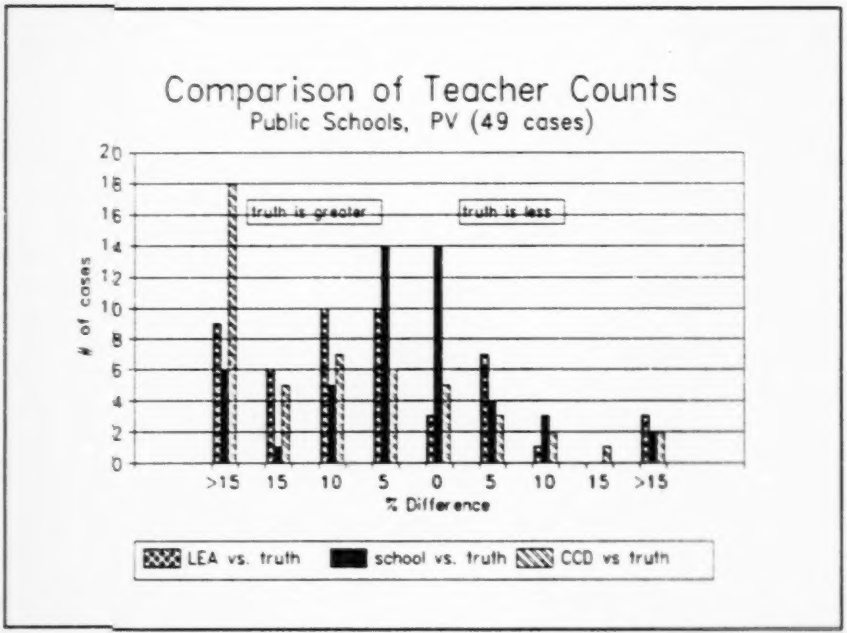
Only 3 of the 49 LEA TLRs contained the correct count of teachers in the school. Twenty were within 5 percent of the truth count. Fourteen school TLRs contained the correct count, while 32 were within 5 percent of the truth count. The data suggest that the school counts (both the exact match and the count within 5 percent) are greater than both the LEA counts and the CCD counts (5 exact matches, 14 within 5 percent). The LEA counts appear fairly consistent with the CCD counts. See table 2 and graph 2.

Table 2 Distribution of Public Schools/LEAs by Percent Difference from Truth Count

Source	No. of schools/LEAs					
of Data	0%	0<P≤5	5<P≤10	10<P≤15	P>15	total
LEA TLR	3	17	11	6	12	49
school TLR	14	18	8	1	8	49
CCD count	5	9	9	6	20	49

- P = the percent difference from the truth count

Graph 2



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3. Public School - Total

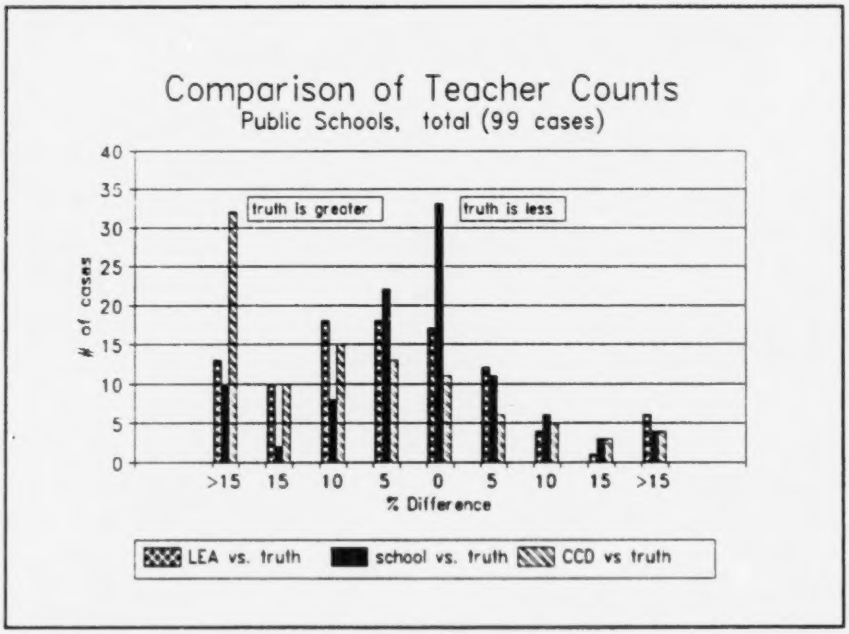
Of the 99 LEA TLRs, 17 contained the correct count of teachers in the school, while 47 were within 5 percent of the truth count. Thirty-three school TLRs contained the correct count, and 66 were within 5 percent of the truth count. The data suggest that the school counts (the exact match and the count within ± 5 percent) are greater than both the LEA counts and the CCD counts (11 exact matches, 30 within 5 percent of the truth count). The LEA counts appear greater than the CCD counts. See table 3 and graph 3.

Table 3 Distribution of Public Schools/LEAs by Percent Difference from Truth Count

Source	No. of schools/LEAs					
of Data	0%	0<P≤5	5<P≤10	10<P≤15	P>15	total
LEA TLR	17	30	22	11	19	99
school TLR	33	33	14	5	14	99
CCD count	11	19	20	13	36	99

- P = the percent difference from the truth count

Graph 3



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Of the 99 public schools in the component 1 reinterview sample, we discovered, through the reinterview, that the LEAs and schools **incorrectly excluded** the following types of teachers the most: (See Attachment B for a complete list and description of the groups of teachers and non-teachers.)

Table 4 Types of Teachers Excluded on TLR by LEAs and Public Schools

Teacher Category	Number of LEAs	Number of schools
• general full-time	30	22
• part-time	21	15
• specialized subject matter	17	15
• special ed.	10	10
• long-term sub	10	6
• itinerant	9	5

Note: Only one public school (and it's LEA) missed a homebound teacher. It was picked up during the reinterview. This was the only instance in the study where a school (public or private) mentioned they had a homebound teacher.

We discovered that the LEAs and schools **incorrectly included** the following types of non-teachers the most:

Table 5 Types of Non-teachers Included on TLR by LEAs and Public Schools

Non-teacher Category	Number of LEAs	Number of schools
• other non-teacher	18	11
• librarian	10	18
• speech therapist	10	18
• guidance counselor	14	9
• principal / asst. principal	6	3
• other school staff	5	4

4. Private School - Total

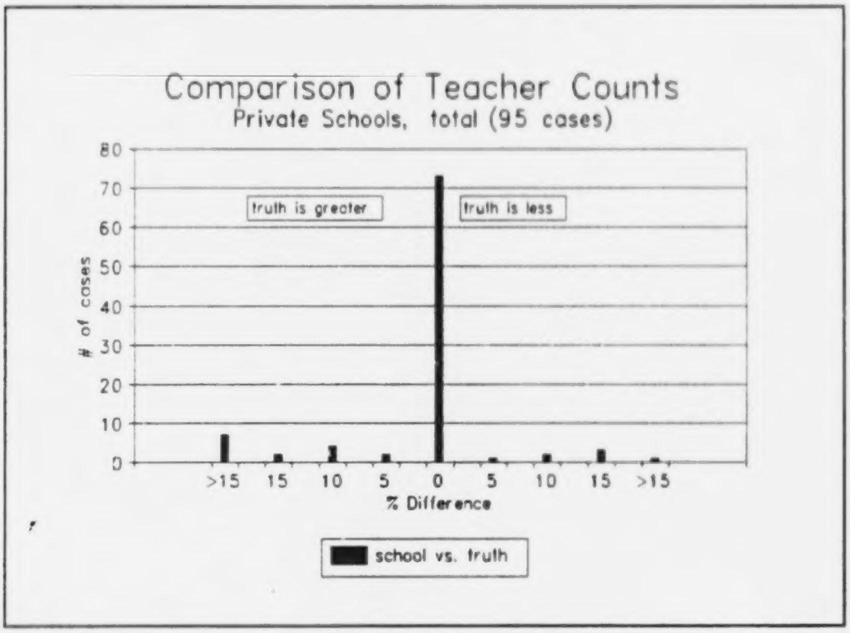
Seventy-three of 95 school TLRs contained the correct count of teachers in the school, while 76 were within 5 percent of the truth count. The data suggest that there is no major difference between the telephone cases and the personal visit cases. See table 6 and graph 4.

Table 6 Distribution of Private Schools by Mode of Reinterview and by Percent Difference from Truth Count

Source	No. of schools					
of Data	0%	0<P≤5	5<P≤10	10<P≤15	P>15	total
telephone	39	0	2	4	3	47
PV	34	3	4	2	5	48
total	73	3	6	5	8	95

- P = the percent difference from the truth count

Graph 4



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Overall, the 95 private schools in the component 1 reinterview sample didn't seem to have a lot of problems listing teachers (that is, not nearly as many as the public schools). Of these schools, we discovered that the schools **incorrectly excluded** the following types of teachers the most:

Table 7 Types of Teachers Excluded on TLR by Private Schools

Teacher Category	Number of original TLRs	Number of reint. TLRs
• general full-time	5	3
• subject matter	4	2
• specialized subject matter	2	4
• part-time	1	3
• other teacher	2	1

We discovered that the schools **incorrectly included** the following types of non-teachers the most:

Table 8 Types of Non-teachers Included on TLR by Private Schools

Non-teacher Category	Number of original TLRs	Number of reint. TLRs
• principal / asst. principal	4	6
• pre-K	2	7
• librarian	2	5
• other non-teacher	2	3

B. Component 2: TLR vs. School Questionnaire

1. Public Schools

Fifty-five of 88 school TLRs contained the correct count of teachers in the school, while 68 were within 5 percent of the truth count. The SASS-3X count was correct for 12 cases, while 26 were within 5 percent of the truth count. The data suggest that the TLR counts are greater than the 3X counts, and both the TLR counts and the 3X counts are greater than the

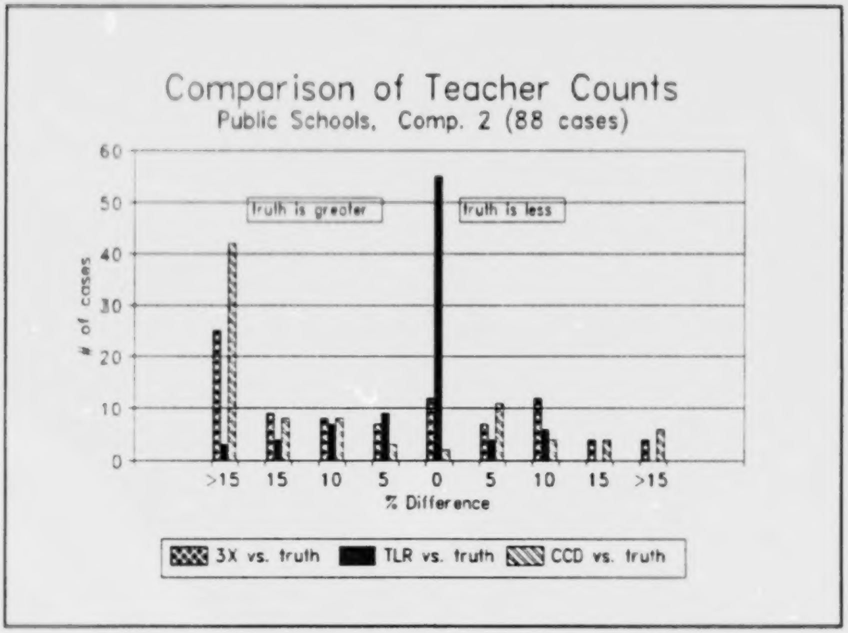
CCD counts (2 exact matches, 16 within 5 percent of the actual count). See table 9 and graph 5.

Table 9 Distribution of Public Schools by Percent Difference from Truth Count

Source	No. of schools					
of Data	0%	0<P≤5	5<P≤10	10<P≤15	P>15	total
3X quest.	12	14	20	13	29	88
school TLR	55	13	13	4	3	88
CCD count	2	14	12	12	48	88

- P = the percent difference from the truth count

Graph 5



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Of the 100 public schools in the component 2 reinterview sample, we discovered that the schools **incorrectly excluded** the following types of teachers the most:

Table 10 Types of Teachers Excluded on TLR and School Questionnaire (SASS-3X) by Public Schools

Teacher Category	Number of 3Xs	Number of TLRs
• part-time	18	10
• general full-time	15	5
• special ed.	3	9
• specialized subject matter	2	6
• subject matter	0	5
• itinerant	2	3
• Chapter 1	2	3

We discovered that the schools **incorrectly included** the following types of non-teachers the most:

Table 11 Types of Non-teachers Included on TLR and School Questionnaire (SASS-3X) by Public Schools

Non-teacher Category	Number of 3Xs	Number of TLRs
• librarian	11	4
• other non-teacher	10	4
• pre-k	4	3
• principal / asst. principal	4	2
• guidance counselor	4	2
• speech therapist	2	4

Note: Three 3X questionnaires included persons with teaching and non-teaching duties. Two were guidance counselors and one was an other school staff person. The 3X instructed the respondent to do this, while the TLR instructions did not.

2. Private Schools

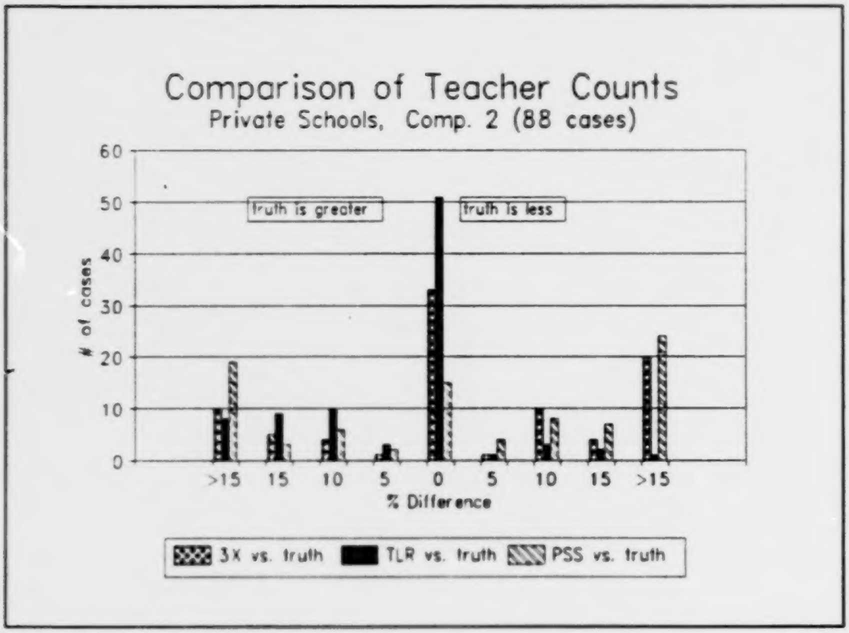
Of the 88 school TLRs, 51 contained the correct count of teachers in the school, and 55 were within 5 percent of the actual count. The SASS-3X count was correct for 33 cases, while 35 were within 5 percent of the truth count. The data suggest that the TLR counts are greater than the 3X counts, and both the TLR counts and the 3X counts are greater than the PSS counts (15 exact matches, 21 within 5 percent of the truth count). See table 12 and graph 6.

Table 12 Distribution of Private Schools by Percent Difference from Truth Count

Source	No. of schools					
of Data	0%	0<P≤5	5<P≤10	10<P≤15	P>15	total
3X quest.	33	2	14	9	30	88
school TLR	51	4	13	11	9	88
PSS count	15	6	14	10	43	88

- P = the percent difference from the truth count

Graph 6



Of the 98 private schools in the component 2 reinterview sample, we discovered that the schools **incorrectly excluded** the following types of teachers the most:

Table 13 Types of Teachers Excluded on TLR and School Questionnaire (SASS-3X) by Private Schools

Teacher Category	Number of 3Xs	Number of TLRs
• part-time	13	17
• general full-time	6	10
• subject matter	1	4
• Chapter 1	2	3
• specialized subject matter	0	4
• itinerant	3	0

We discovered that the schools **incorrectly included** the following types of non-teachers the most:

Table 14 Types of Non-teachers Included on TLR and School Questionnaire (SASS-3X) by Private Schools

Non-teacher Category	Number of 3Xs	Number of TLRs
• pre-k	13	1
• librarian	6	4
• other non-teacher	8	0
• principal / asst. principal	5	2
• other school staff	4	1
• guidance counselor	4	0

Note: **Twenty-two 3X questionnaires included persons with teaching and non-teaching duties. (Two of the 22 contained two different types.) Twenty-one were from group (1) - principals, one was from group (2) - guidance counselor, and 2 were from group (6) - other school staff. The 3X instructed the respondent to do this, while the TLR instructions did not.**

Attachment A-1
June 3, 1994

TLVS Sample

The public school sample was selected from the public school universe file that was going to be used for the school phase of the 1993 SASS. (The 1993 SASS was ultimately postponed until 1994.) Each public school's LEA was selected as well (for component 1, only). The private school sample was selected from the private school universe file that was current at that time (August 1992).

Before selecting the public and private school samples, we deleted schools in certain states from each of the universe files. These states had high field costs. The states are listed below.

States dropped from TLVS

- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Hawaii
- Idaho
- Kansas
- Louisiana
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Mexico
- New York
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Texas
- Utah
- Washington
- Wyoming

After we deleted the schools in the states listed above, we selected the samples. We selected the samples using the average teacher adjustment factor (TAF) from the 1990-91 weighting as a guideline. This adjustment factor is based on a weighted average of the ratio between the number of teachers reported on the school questionnaire (numerator) and the number of teachers reported on the TLR (denominator). The teacher adjustment factors for the public schools were at the state level, while the factors for the private schools were at the association membership (or affiliation) level (i.e., Catholic, Episcopal, Montessori, etc.).

For public schools, each state's TAF was defined as "good" if $0.9 \le TAF \le 1.1$, and defined as "bad" if $TAF > 1.1$ or $TAF < 0.9$. For private schools, each affiliation's TAF was defined as "good" if $0.8 \le TAF \le 1$ and "bad" if $TAF < 0.8$. "Good" and "bad" refer to how similar the teacher counts were on both the school questionnaire and TLR. The "bad" states and affiliations are listed on the next page.

Note: The private school TAFs were all less than 1. This was because the weighted average of counts from the teacher file (i.e., TLR counts) were always greater than the weighted average of counts from the school file (i.e., school questionnaire). After the sample was selected, errors were found on the private teacher file which made those counts greater than they were supposed to be.

"Bad", or Poor Reporting States

The following states were poor reporting states, in terms of reporting consistent teacher counts in the 1987-88 and 1990-91 SASS using the school questionnaire and the TLR.

- District of Columbia
- Georgia
- Illinois
- Iowa
- Massachusetts
- Michigan
- New Hampshire
- Rhode Island
- South Dakota
- Vermont
- Wisconsin

"Bad", or Poor Reporting Association Memberships (or Affiliations)

- Catholic
- Friends
- Episcopal
- National Society for Hebrew Day Schools
- Solomon Schechter Day Schools
- Other Jewish
- Evangelical Lutheran Church in America
- Other Lutheran
- American Association of Christian Schools
- National Association of Private Schools for Exceptional Children
- Montessori
- All Else

The public school sample contained a higher percentage of schools from the poor (or "bad") reporting states (70% poor, 30% good). The private schools contained a higher percentage of schools from the poor reporting affiliations (75% poor, 25% good). This guaranteed us of getting differences in counts in (at least) some of the schools.

In addition, schools from certain counties were dropped from the public school sample after sampling. These counties contain school districts that consistently had poor response rates (based on the 1987-88 and 1990-91 SASS). The counties are listed on the next page.

Attachment A-3
June 3, 1994

Counties dropped from the Public School Sample

- Baltimore MD
- Chesterfield County VA
- Dale County FL
- Hartford CT
- Howard County MD
- Jersey City NJ
- Madison WI
- Montgomery County MD
- Newark NJ
- New Haven CT
- Pinellas County FL
- Richmond VA

Attachment B-1
June 3, 1994

Teacher / Non-teacher Categories for the TLVS Report

Teachers

(1) part-time (regardless of subject/title taught)

Any teacher that was listed as part-time is included in this category, regardless of whether there was a subject listed. For example, if the respondent said that "we missed 3 part-time reading teachers", then they would be included in this category, since "part-time" was mentioned.

(2) general full-time (no subject/title given) / general teacher (no explanation at all)

For example, the schools simply reported that they "missed 3 teachers" or "we forgot to include a teacher". In other words, there was no explanation as to what kind of teachers they were (i.e., part-time, full-time, reading, math, etc.)

(3) Subject Matter (math, english, science, social studies) / Kindergarten / Elementary

(4) Specialized Subject Matter or Elective (PE/gym, music [band, orchestra, chorus/choir, instrumental], drama, vocational ed., industrial arts/tech, auto mechanics, carpentry, home ec., driver's ed., art, typing, army/ROTC instructor, ELP [English Limited Proficiency], ESL/bilingual, foreign lang., reading/reading specialist, computers, religion, business ed., health, special services teacher)

(5) Special Ed. (developmental reading, enrichment, basic skills, LD [learning disabled], IEU, behavior disorder, intermediate) / Gifted (exceptional, TAG) / College teacher for HS credit

(6) Itinerant (any subject) / Migrant teacher / Co-op

(7) Chapter 1

(8) Long-term substitute (no subject/title given)

(9) Other teacher (homebound, teacher employed by local govt., teacher employed by public school system that teaches in private school, non-paid/volunteers, non-certified teachers, teachers that teach in another building for this school, teachers on short-term leave [sick, personal day])

Attachment B-2
June 3, 1994

Non-teachers

(10) Principal / Asst. Principal / School Head / Dean of Students / President / other administrator / athletic director / coach

(11) Guidance counselor / other counselor

(12) Librarian / Media Specialist / Resource Person / Learning Center

(13) Speech Therapist/Teacher/Pathologist

(14) School Psychologist / Nurse / Physical Therapist

(15) Other school staff (secretary, service staff, para-professional, social worker, in-school supervision, AV coordinator, planetarium keeper, caseworker, work coordinator, special ed. coordinator)

(16) Pre-k / Pre-school / Director of Pre-school

(17) Teacher Aides / student teacher / tutors (home tutor) / LSS (Learner Support Strategist)

(18) Short-term substitute (no subject/title given)

(19) Other non-teacher (teacher on long-term leave [sick, disability, maternity], teach in another school/teach in another school under this school's principal, PE service that is not faculty, houseparents who teach their kids at home, different grade range on reinterview and original lead to difference, duplicate, teachers in school for different grade range than form, someone that gave lecture at school, teachers that teach at Tech. Institute in same building as school)

DESIGNING THE TEACHER FOLLOWUP SURVEY (TFS):

ISSUE AND CONTENT

David W. Grissmer and Sheila Nataraj Kirby

RAND

DESIGNING THE TEACHER FOLLOWUP SURVEY(TFS): ISSUES AND CONTENT

David W. Grissmer and Sheila Nataraj Kirby
RAND

A large scale longitudinal survey of U.S. teachers and those leaving teaching can address a wide variety of current and future policy and research questions. However, since questionnaire length and survey resources are limited, it is necessary to ask two questions.

(1) What will be the *most important* policy and research questions that will exist during and after the period when the survey will be administered and analyzed?

(2) Which areas of policy and research is this particular survey and sample *uniquely* qualified to address?

The answer to the first question requires a review of the current problems within the teaching profession and a projection of approaching problems, together with some judgements about the severity, importance and amenability of these problems to policy approaches. Common sense dictates that the survey content should aimed at gathering information on issues that are important and are capable of being resolved or at least improved through public policy interventions. We should also be aware of the current state of research knowledge concerning these problems and whether current or alternate data sources can be used to address these issues. If better or equivalent data can be gathered through other sources, an evaluation of the relative cost and quality of the alternate data sources is needed and an assessment of the competitive advantage of this particular survey.

The first section of this paper describes our view of the important current and emerging issues in the teaching profession that can be informed through data collected on a longitudinal survey of teachers. The second section assesses the research and required data needed to address these issues and the role of this survey in collecting that data. Our major focus in this paper is on issues relating to the supply of and demand for teachers primarily because this has been the major focus of our research. We touch briefly on issues outside this area at the end of the paper.

ASSESSING THE CURRENT SUPPLY AND DEMAND SITUATION

Part of the motivation for the SASS--particularly the longitudinal dimension--was to better assess the possibility of a general teacher shortage. Teacher shortages were predicted in the late 1980s and 1990s. One researcher (Darling-Hammond, 1984) pointed out that several of the factors that affect teacher supply and demand were changing in a direction which would increase demand and reduce supply. The ominous factors often cited were the following:

- High teacher attrition rate out of the profession partly due to low salary and poor working conditions;
- Rising teacher retirement rates due to an aging teacher force;
- Rising enrollments due to the baby boom;
- Continuing decline in student/teacher ratios;
- Falling enrollments in education degree programs;
- Falling interest among women in teaching due to more lucrative opportunities in other professions;
- Constriction in the numbers entering teaching because of more stringent entry standards including passing entry level teacher tests and early performance assessments.

A great deal of research was motivated by these predictions. Fortunately many of the original assumptions proved not to be accurate and the predictions of changing factors have sometimes not materialized. We provide a brief summary of what we believe to be the case regarding general teacher supply and demand shortages, and the reasons why shortages did not materialize.

High Teacher Attrition

In the early 1980s, it was generally thought that teacher attrition rates were 8 percent. This was based on an older education department study (Mertz and Fleischman, 1974). Since then, research has shown that attrition rates have declined dramatically, and one estimate of the current annual permanent attrition rate out of the profession is 3 percent or less (Grissmer and Kirby, 1987, 1992). Another estimate of the annual attrition rates comes from the Teacher Followup Survey of the Schools and Staffing

Survey(SASS), and places it around 5.6 percent(Bobbitt, et al, 1991). However, it is the permanent attrition rate rather than the annual attrition rate which governs shortage calculations. Converting the annual rate to a permanent rate requires making an estimate of how many teachers who leave annually will return to teaching.

We now know that about 1/4 to 1/3 of teachers leaving within a state will return within that state—usually within 5 years (Murnane, Singer and Willet, 1989; Grissmer and Kirby, 1992). When we take into account teachers moving to other states, it is probably the case that almost one in two teachers leaving in any year will return to teaching. So the SASS estimate for annual attrition of 5.6 percent would translate into a permanent attrition rate of about 2.8 percent.

These permanent attrition estimates are less than one-half of the original 8 percent estimate which means that estimates of the demand for new teachers is also reduced by more than one-half. This is probably the main reason that predictions of shortages did not materialize. We simply did not need to replace as many teachers as the original estimates indicated.

Moreover, teacher attrition rates have probably been falling for over 20 years and probably will continue to fall during the 1990s (Grissmer and Kirby, 1992). In Indiana, attrition rates are currently at the lowest level of the last 20 years: they have fallen from 13 percent to less than 5 percent in 1989 (Grissmer and Kirby, 1992). Permanent attrition rates have fallen in a similar fashion. There are several reasons for this. First, the teaching population is much older in 1992 than in 1971, and the strongest determinant of attrition is years of teaching experience/age. Second, women are leaving teaching at an all-time low rate, and when they do leave they are much more likely to return, and to take shorter breaks from teaching. This shift has little to do with salary or working conditions; it arises primarily from the changed labor force participation of women over the last 20 years. Women's jobs have become an important part of family income, and whereas in earlier times, dropping out for long periods was the norm, it no longer is the case. Women's persistence in the teaching workforce has lowered attrition rates significantly, and lowered the demand for new teachers.

Other factors which account for the low attrition are the older entry age of new teachers (Murnane and Olsen, 1989; Kirby, Grissmer and Hudson, 1991; Murnane and Schwinden, 1991) and higher real teacher salaries. New teachers are more often drawn from the 30–45 age group, and individuals who enter at a later age have lower attrition than those entering at younger ages. Salary levels also began to rise in the early 1980s, and recent research has shown that attrition rates tend to be fairly sensitive to salary and salary growth (Murnane and Olsen, 1990; Murnane and Olsen, 1989; Murnane, Singer and Willet, 1989; Grissmer and Kirby, 1992).

We believe that the factors that have brought about a decline in attrition in recent years will tend to persist and continue to exert downward pressure on attrition rates in the next 10 years. Eventually the increase in retirement rates will once again push attrition rates higher.

Increasing Teacher Retirement Rates

Predictions of massive retirements of teachers also fueled predictions of teacher shortages. While retirement rates are increasing and will continue to increase for the next 15 years, the annual number of teachers retiring will be much larger after 2005 than during the 1990s. The increasing retirement rate simply reflects the somewhat unbalanced age distribution of the current teaching population. The average teacher age is around 42, making one-half of teachers within 15 years of retirement eligibility. However, most teachers do not retire at 55, but more often retire at 62 and 65. If we assume a median retirement age of 62 and a current median age of 42, this means that the bulk of teachers will retire between 2005 and 2015. This slower rate of retirement means that new teacher demand will increase more slowly than thought, and replacing large numbers of retiring teachers is more likely after 2005 than in the 1990s. However, early retirement offers could significantly change this pattern.

Rising Enrollments and Falling Student-Teacher Ratios

The original predictions of teacher shortages were partially based on a prediction of higher enrollments nationally; this has certainly been proved accurate and in fact, enrollments probably have been higher than originally predicted due to higher than expected immigration. The increase of about 12 percent will tend to modestly increase demand for teachers if student/teacher ratios stay constant. While student/teacher ratios have continued to decline, especially for earlier grades and math and English courses in high schools, many states have budget problems, and the rate of decline may slow considerably. In some cases backsliding may occur. In any case the demand for new teachers from enrollment increases and falling student-teacher ratios is dwarfed by the falling attrition rates which primarily determines demand for new teachers.

Falling Enrollments in Education Programs

The original analysis was made at the time of lowest enrollments in education programs at universities. This enrollment had been falling since the early 1970s. However, the prediction did not take into account student reaction to the perceived increasing opportunities in education. The market seems to be working to increase enrollments in education. Education enrollments have been increasing fairly strongly in the last few years. Perhaps more importantly, recent analysis has shown that new graduates from education programs usually fill one-half or less of vacancies each year (Murnane, Singer and Willet, 1988; Kirby, Grissmer and Hudson, 1991). Returning and migrating teachers (part of the so-called reserve pool) meet a large part of the annual demand for new teachers. Thus, the importance of current enrollments in education programs in teacher supply is much less than previously thought. Instead of needing to fill all of the demand, new graduates have been needed only fill one-half or less of current demand.

Declining Interest among Women in Teaching

One of the factors mentioned in the original prediction of teacher shortage was the likelihood that women would be attracted to other professions such as law, medicine and business due to higher salaries and that the supply of women teachers would decline. However, the rush of women to the labor force and the increasing role they play in providing family income in the last 20 years has resulted in *stronger* interest from women in teaching. In Indiana, women have become a larger percentage of the teaching force in the last 20 years, and we believe that is probably true in most states (Kirby, Grissmer and Hudson, 1991; Grissmer and Kirby, 1992). While it is true that more women are going into law, medicine, and business, it is also true that more women are going into teaching. The large increases in the population of women 20–35 and their stronger labor force participation has resulted in more women in almost all professions.

More Stringent Standards

We have no strong research evidence to support the hypothesis that fewer new teachers enter and stay due to either fear or failure of entry tests or performance assessments. The evidence in Indiana is that attrition rates of young teachers has declined—not increased—over the last 5 years—roughly the period when testing was introduced. We would suggest that the result of most testing is to simply delay entry into teaching. While individuals may fail the first time, the failure rates for multiple chances at passing is generally very low. The results of performance assessments could be similar.

CURRENT AND EMERGING ISSUES

Although we believe that there is no danger of an imminent general teacher shortage, there are several issues that merit research attention in the general area of teacher supply and demand. In addition there are some interesting future supply and demand scenarios that need to be examined.

- Specific supply and demand analysis for teaching specialities which have shortages(math and science, special education, etc);
- Supply and demand analysis for minority teachers;
- Predicting retirement ages of teachers;
- Effects of early retirement offers on teacher demand;
- Effects of the declining number of returning and migrating teachers on the demand for teachers;
- Supply and attrition of high quality teachers;
- Improved International Comparisons of Teacher Wages, Working Conditions, Attrition Patterns and Quality.

We will discuss each of these below.

Supply and Demand for Speciality Areas Having Shortages

Science and Mathematics teachers have persistent reported shortages throughout the nation. One hypothesis for the shortages may be a higher attrition rates of these teachers. Studies of attrition rates of mathematics and science teachers have reached apparently different conclusions. However, the methodologies, samples and attrition definitions used are quite different and make any direct comparisons invalid.

Research based on state data sources from Michigan (Murnane and Olsen, 1989), North Carolina (Murnane and Olsen, 1990) and Indiana (Grissmer and Kirby, 1992) all conclude that physics/chemistry teachers have significantly higher attrition rates than average and that biology teachers usually have somewhat higher attrition than average. However, all three studies find that attrition rates for mathematics teachers is closer to the average for all teachers.

These studies all use cohort survival analysis as the basis for their conclusions. The entering cohorts studied in the analysis are different across states. The Michigan analysis used entering cohorts from 1972 to 1980 followed through 1984, and the North

Carolina analysis used the 1976 and 1978 cohort followed through 1986, while the Indiana analysis used the 1966 through 1985 cohorts followed through 1988. The findings apply whether the definition of attrition includes or does not include returning teachers. However, the results are much stronger when returning teachers are not counted in the attrition definition since mathematics and science teachers return at much lower rates than other types of teachers (Murnane, Singer and Willet, 1988; Grissmer and Kirby, 1992).

A recent analysis of attrition (Bobbitt, et al, 1991) using the national sample of teachers from the Schools and Staffing Surveys (SASS) and the Teacher Followup Survey (TFS) concluded that Chemistry/Physics, Biology and Mathematics had attrition rates below the average for all teachers. These were based on attrition in a single year (1987–88 to 1988–89).

Three factors that could aid in explaining these conflicting results are the use of different samples, different time periods and different definitions of attrition. A cohort sample measures early attrition for younger teachers whereas a cross sectional sample of all teachers measures attrition for all age groups. So the state measurements and national measurements are not comparable.

The second explanation is that the attrition measurements were for different time periods. The state cohort data measures average attrition for cohorts during the late 1960s, the 1970s and early 1980s. The national sample measures attrition from 1987–88 to 1988–89. Evidence from Indiana (Grissmer and Kirby, 1992) seem to indicate that teacher attrition rates have fallen over time with the exception of a period in the late 1970s in which teacher reductions in force occurred. Data from Michigan seems to counter this trend (Murnane and Olsen, 1989) with earlier cohorts in the early 1970s having lower attrition than the cohorts in the late 1970s. However, this may be due to the choice of the late 1970s as the second time period since RIFs were present. Other data which continues into the 1980s indicates much lower attrition in the 1980s than the early 1970s. If this is true then comparing rates for different time periods probably cannot be done.

The definition of attrition can also present comparability problems. The national sample measures annual attrition without taking account of returning teachers, and the state analysis measures cohort attrition in two ways—including and excluding returning teachers from the attrition measure. Since about 1/3 of teachers return (Murnane, Singer and Willet, 1988; Grissmer and Kirby, 1992), comparing attrition without comparable treatment of returning teachers can make estimates very different. This is especially true when comparing attrition rates of science/math teachers with other teachers. Science and math teachers return much less frequently than other types of teachers (Murnane, Singer and Willet, 1988; Grissmer and Kirby, 1992). This means that annual attrition rates for science and mathematics teachers could be similar or even lower, but the lower return rates would make permanent rates higher for science teachers. While this may explain part of the discrepancy, it is also true that the state measurements show higher annual cohort attrition for science teachers.

Other explanations are possible, but we think less likely. The particular states used in the analysis may have quite different attrition patterns, and may not be nationally representative. However, many of the other results from the states and national data are not in conflict. It is possible that the age and gender distribution of science teachers in the states is different than the national distribution. This could easily be checked. It is also possible that the classifications used for science and math teachers are very different. The state cohort data classified the teachers on the basis of what they taught in the first year of teaching. The SASS and TFS classified teachers on the basis of their main assignment in the initial year of the survey--1987–88. These might be very different groups.

More research is needed to discover the causes of the significant attrition differences among types of science and math teachers. One hypothesis is that it simply reflects differences in outside job opportunities (Murnane, Singer and Willet, 1988). The hypothesis is that mathematics teaching training may provide less job transferability than that of science training. This is especially true of those teaching lower levels of mathematics. Another hypothesis is that laboratory teaching as opposed to classroom teaching is inherently harder, and there is greater sensitivity to quality of equipment and facilities (Grissmer and Kirby, 1992). Survey responses (Weiss and Boyd, 1990) from science and math teachers show differences in their sensitivities to working conditions. Science teachers rate facilities and equipment and "time for hands-on instruction" as key aspects of their dissatisfaction with teaching. Finally, the differences may reflect differences in gender proportions in each area and their sensitivities. Men may be more sensitive to lack of administrative support and low salaries than women (Weiss and Boyd, 1990). This sensitivity would be heightened by higher outside opportunities. Any specialty with more males—other things equal—would have higher attrition in situations where higher outside wage opportunities exist.

Minority Teachers

Declining proportions of minority teachers could occur at a time when minority enrollments are rising. The cause of lower minority proportions may be more attributable to lower minority college enrollments and choice of education as a career rather than lower proportions of minority certified applicants obtaining jobs (Murnane and Schwinden, 1989). The studies of state data have not generally focused on the question of differences in attrition rates among racial groups. The SASS and TFS analysis generally show white and black rates to be similar, but lower attrition for Hispanic teachers (Bobbitt, Faupel and Burns, 1991). More specific analysis of minority supply and demand is required.

Teacher Early Retirement and Teacher Demand

The teaching force is unbalanced with respect to age and experience. Younger teachers—those under 35--are a smaller portion of the teaching force than at any time in the last 25 years, and one-half of teachers are over 42 making them retirement eligible at age 55 within 13 years. An important supply and demand question is how soon these retirement will occur, and when replacements will be needed. Current retirement patterns show a strong tendency for teachers to stay until 62 or 65. If this is the case, then demand for new teachers will increase more slowly. On the other hand, budget problems in states could make early retirement offers very attractive. Replacing older teachers with younger teachers significantly reduces education costs—even with somewhat increased retirement costs. Retirement costs are not generally paid out of operating budgets making early retirement even more attractive.

Research is needed on the precise patterns of teacher retirement and the effects that early retirement offers have on the decision to leave teaching. Massive early retirement could increase demand for younger teachers significantly. The federal government could also provide states with research on the effects of different types of early retirement offers. Research is also needed on quality issues inherit in early retirement offers. Is the tradeoff of younger for older teachers likely to increase teacher quality?

The Declining Reserve Pool

Perhaps the most ominous trend for future shortages is the fact that the supply of returning and migrating teachers will be declining in future years. We currently depend on these teachers to fill about 50 percent or more of vacancies in any year. If there are fewer returning and migrating teachers, then we will need more younger teachers. Returning and migrating teachers will decline because of simple demographics. Teachers who return to teaching leave teaching most often between 25–35 years of age. Teachers past 40 leave teaching less frequently. So as the average age of the teaching population increases, there will be a smaller reserve pool of teachers. Teacher migration also peaks during the 25–35 age span. Since there are going to be fewer teachers in this age span as the teaching force ages, there will be fewer returning and migrating teachers to fill vacancies.

We need more research on the patterns of returning and migrating teachers to determine the precise decline in these pools over the next 5–15 years. Data available from several states could be readily utilized to explore these patterns and the subsequent decline in the reserve pool. The SASS and TFS data will have only limited utility here because they will not capture the longer time period in which many teachers return. Estimating the changing return rates of teachers would enable better estimates to be made of the reserve pool, and the timing of the much stronger demand for new teachers. If this occurs about the time of massive early retirements, a problem in supply could result. So this research needs to be combined with the early retirement research to determine the relative timing of the two phenomena.

Supply and Attrition of High Quality Teachers

Research has generally established the lower entrance rate and higher attrition rate of students who score well on tests (Vance and Schlechty, 1982; Murnane, Singer and Willet, 1989; Manski, 1987; Murnane and Schwinden, 1989). The latter study distinguishes between white and black applicants and shows that black applicants show the opposite effect—namely that higher NTE scores lead to increased chances of entry into teaching. There have been many programs within colleges to attract better students, and better induction programs into teaching may lower attrition rates (Hudson, Grissmer and Kirby, 1991). But research is needed to discover differences in quality teachers who stay and leave and the role of salary and working conditions in these decisions.

International Comparisons of Teacher Wages, Working Conditions and Quality

National competitiveness partly depends on the effectiveness of building human capital during the educational process. Teachers are a critical part of this process, and differences in quality of teachers between countries can lead to competitive advantages among nations. Several recent comparisons of teachers shows important differences in the training, wages, working conditions and performance of teachers in different countries. Better assessment of these differences can provide for a more thorough analysis of the effects of these differences. Since the SASS survey will be the only survey that is representative of U.S. teachers, it will be the only data collection instrument capable of international comparisons. Some assessment of the opportunities available for international comparisons are needed in the SASS design.

SPECIFIC SUGGESTIONS FOR THE SASS

Below are some suggestions regarding the sample and content of the new SASS survey.

Sample

The emerging policy issues suggest that most problems will be among specific groups of teachers. It would be important in addressing these problems to be able to identify and insure adequate sample sizes for these groups in the followup surveys, perhaps through stratification. The important groups are the following:

- science/math, special education and other shortage specialities;
- entering teachers;
- new, migrating or returning teachers;
- teachers who are at or near retirement eligibility;
- minority teachers;
- senior education and noneducation majors;
- higher quality teachers;
- samples of teachers from other countries;

Low attrition rates makes sampling a particular problem. It is the comparison of staying and leaving teachers that provides the best research opportunities for studying attrition. However, if only 6 percent of teachers leave each year, the attrition samples from specialized groups can become small quickly. This is compounded if we want to study returning teachers who constitute only 1 out of 2 of leaving teachers. Since we cannot predict teachers who will attrit or return, we cannot oversample leaving or returning teachers in the original sample. The only method of enlarging the sample of attriting or returning teachers is through larger initial samples of the teachers.

A careful assessment is needed of the sample sizes needed for shortage specialities, minority teachers, new teachers, and teachers near or at retirement. This assessment needs to take into account the specific sizes of the original samples as well as the attrition rates and return rates from these samples. Appropriate oversampling for these groups may be needed for adequate reseach samples.

An important parameter that needs better estimation in supply/demand analysis is the proportion of education majors who enter teaching. We currently cannot estimate future supply until we know what proportion of newly graduating teachers want to teach and what proportion actually find jobs. A key indicator of possible shortages is also the number of education majors wanting to teach who cannot find jobs. We have found evidence of queueing of inexperienced teachers in Indiana. Many education majors accept teacher's aide jobs or other jobs, but remain available for fulltime time jobs should they become available.

Coordinating a survey of senior education majors with the SASS survey and followup would provide these key estimates and indicators. A sample size of senior majors which is a small fraction of the total SASS sample would be sufficient for research on this group. Presumably this group would also be followed up whether they entered teaching or not. Such a sample would have a much wider applicability. The decision to enter teaching could be analyzed and salary trends for teachers and nonteachers tracked.

In a similar fashion a similarly sized sample of noneducation majors would provide for better research on the supply of teachers, the decision to enter teaching and the quality of teachers. Many teachers do not major in education, but constitute an important supply source of teachers. This sample would also allow a better comparison of wages and benefits among teachers and nonteachers, and better relative quality measures of teachers and nonteachers. A key policy concern is the quality of teachers. This concern cannot be adequately addressed by the current SASS sample. The sample can distinguish between measures of quality for stayers and leavers, but because it does not collect data from students not entering teaching it cannot determine the relative quality of individuals entering teaching. A sample of noneducation seniors would allow us to get a better handle on this aspect.

Finally, the SASS could provide an opportunity to make international comparison of teachers. Relatively small teacher samples collected from other countries could significantly improve comparison of teachers. In addition small samples of seniors in other countries could provide the relative proportion of higher scoring individuals entering teaching.

Content

We suggest two types of changes in content to the SASS. The first is new categories of variables important to supply and demand analysis. The second is better defined measures than were fielded in the first SASS.

Teacher Retirement

At the time that the followup to the SASS is ready for analysis, early retirement of teachers will probably be a major policy issue. If budgetary pressures on states and cities continue, substituting younger less expensive teachers for older teachers will be increasingly utilized. The timing of retirement decisions is also an important variable in determining the needed supply of new teachers. Since the number of teachers reaching retirement eligibility will increase markedly after 2000, predicting when these teachers will retire will be important to determining the needed new supply. The SASS could provide useful information on these issues. A series of questions dealing with retirement decisions and early retirement offers could provide this information. Such items as the following would be useful:

- plans on the timing of retirement;
- whether early retirement offers are made;
- level of retirement pay;
- post-retirement jobs and earnings.

The Size of the Reserve Pool

A second issue that the new survey could aid in addressing is estimating the size of the reserve pool. This issue together with early retirement will be the critical variables in determining the needed supply of new teachers. Estimating the reserve pool requires data on the following:

- estimating the number of leaving teachers and their likelihood of returning;
- estimating the number of education graduates who have not taught and their chances of teaching;
- estimating the number of noneducation graduates who will eventually teach.

The first estimates can be derived from models developed from the followup surveys of teachers. Most teachers return within 4 years and good models could be estimated from this length of followup. While good models of returning teachers within a state can be estimated from state data, the national survey is the only one that can include teachers returning to teach in other states. This is an important component of returning teachers. Items concerning returning to teaching would include the following:

- plans to return to teaching;
- timing of possible reentrance;
- job search activity for reentrance;
- whether offers received;
- difficulty of job market.

The last two components of the reserve pool--education majors who have not entered teaching and sources of teachers from other majors--could be estimated if a sample of senior education and noneducation graduates were included in the teacher survey. The survey would then become a survey of teachers and potential teachers. Following teaching candidates into the teaching force will allow estimates of the potential supply emereging from graduating classes. In times of teacher surplus like the present, the queue of new, inexperienced teachers desiring jobs is perhaps the key indicator of surplus supply. Many are delayed in entry to teaching because of job scarcity. This queue is gradually reduced as surplus turns to shortage and provides the best leading indicator of potential teacher shortages. The items that could be included in a sample of potential teachers from college seniors and the followup of this group are:

- plans to teach;
- job search/applications made/offers received;
- alternate job offers/opportunities/wage levels;
- plans for continuation to pursue teaching opportunities;
- reasons for not teaching;
- grades/scores/indicators of academic achievement.

The followup of this college senior sample will also provide the best indication of competing job opportunities and wage levels of alternate job opportunities.

Relative Quality, Wages and Working Conditions of U.S. Teachers

The comparative quality, wage levels and working conditions of U.S. teachers with respect to other countries is emerging as an important issue in economic competitiveness. Evidence for higher levels of relative wages, better working conditions and better academic input into teachers of competing countries raises concerns about the role of these factors in student achievement comparisons. Good international comparisons of teachers with comparable samples and similar items have not been done. The new teacher survey provides the opportunity to make these comparisons with expansion of the sample to several selected countries. These foreign samples should ideally contain both teachers and college seniors in order to compare the academic standing of those entering teaching.

IMPROVED MEASURES

We would recommend several changes to the item content of the new survey in order to better support estimation of specific attrition and return models. These models would utilize the followup surveys to support logit analysis of the factors determining attrition and return. Research has provided evidence for the inclusion of specific variables in these models--many of which were not included on the SASS survey.

Improved wage and benefit variables: Teachers are one of the few professions where future wages can be estimated with some degree of accuracy. The uniform pay schedules provide future salary levels and upper level limits to salary in the absence of inflation. Inflationary increases may be somewhat unpredictable. Evidence and thoery would indicate that teacher attrition is sensitive to the level of predicted wage growth and anticipation of the likelihood of inflation adjustments. Teachers may leave teaching not so much because of today's wage levels, but to the anticipated limits to future wage levels. Since there is no provision in teacher compensation to reward better quality teachers, the higher quality teachers can look forward to no higher wages than their poorer teaching peers. Thus it is important to collect not only current wage data but recent historical wage levels (last year's wage as well as this year) and future anticipated wage level (perhaps long term upper limits). In comparing wages of those staying and leaving teaching, it is important to compare the wages of those leaving with the level of pay they would have made had they remained in teaching. Thus it is important to be able to project future salary levels.

Benefits also play an important role in total teacher compensation. Differing benefit levels can create substantial differences in two teachers who have the same level of pay. More specific data on teacher costs for health plans and retirement benefits would support better attrition models. In teacher satisfaction scales and comparisons with other jobs, we recommend separating out health and retirement benefits rather than ask the general level of satisfaction with benefits.

It would also provide better research opportunities for comparing teaching and nonteaching jobs to make income and benefit question match those on the CPS surveys. This would allow comparison of wages and benefits of teachers with those of similar age and education. In these comparisons it would be important to not only look at the median wages, but the variance of wages within similar groups. Higher quality teachers may leave because of the lack of variance of wages. CPS comparisons could also provide better measures of the relative changes in teaching and nonteaching wages over time.

Leading Indicators of Attrition: The initial survey could support better predictions of who will leave if more behavioral measures of leaving were collected. These would include:

o plans and preparation for entering other jobs;
o actual job search activity outside education;
o moonlighting activities;
o anticipated spouse moves/family formation.

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Understanding the Supply of Elementary and Secondary Teachers: The Role of the School and Staffing Survey and the Teacher Followup Survey

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Abstract

The primary question in selecting the substantive issues that the TFS should address is: What pertinent information about teachers and teacher career choices is not available from other sources? To begin answering this question, this paper addresses (a) data that are currently available, (b) information about elementary and secondary school teachers and their careers that is important, but currently inaccessible, and (c) suggestions for additional data collection that falls outside the realm of the TFS, but informs research on teachers and teacher career choices. The focus of additional data collection efforts should be (a) school-specific information on administration and operations, (b) the contextual setting of teachers' current assignments, (c) retrospective information on teaching experiences, (d) labor market experiences of former and returning teachers; and, (e) teachers' perceptions of proposed educational reform policies.

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Understanding the Supply of Elementary and Secondary Teachers: The Role of the School and Staffing Survey and the Teacher Followup Survey

The education system in the United States has received an unprecedented amount of public attention since the early 1980s as both policy makers and citizens recognize the importance of education in a highly competitive global market place. This recognition has led to a flurry of educational reform activities focused on the improvement of the elementary and secondary education system in the U.S. Leaders in the education reform movement, knowing that informed policy prescriptions require a comprehensive picture of the education system, initiated an extensive data collection effort of which the School and Staffing Survey (SASS) and the Teacher Followup Survey (TFS) are essential components.

Significant improvements in elementary and secondary education hinge on the nation's ability to attract and retain highly qualified individuals in the teaching profession. A large number of factors inspire individuals to pursue a teaching career. These factors range from the financial rewards of the teaching profession to a host of intangible rewards individuals receive in their role as "teacher." Understanding the importance of all of the factors that affect individual career choices is necessary to formulate effective public policies designed to ensure an adequate supply of qualified teachers through the 1990s and into the 21st century.

A wealth of data about individual teachers, schools and surrounding communities are needed to understand the determinants of the supply of elementary and secondary teachers. The purpose of this paper is to identify the vital role SASS and TFS play in providing this wealth of information with a focus on identifying the substantive issues that should be addressed in the 1994-95 TFS.

Our primary objective in this paper is to identify the pertinent information concerning teachers and teacher career choices that longitudinal surveys such as SASS and

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TFS should include, paying particular attention to the data that are not available from other sources. To achieve this aim, and facilitate discussions at the National Center for Education Statistics (NCES), we have divided the subsequent discussion into three sections:

1. A brief description of the data that are currently available to explore the determinants of teacher supply;
2. A discussion of the information currently unavailable in existing data sources that is needed to thoroughly understand the career decisions of teachers; and,
3. Suggestions for additional data collection efforts that can be extremely informative about the supply of elementary and secondary teachers.

In each section the focus in on the 1994-95 TFS, but when appropriate, we refer to the upcoming SASS.

1. Existing Information and Data Sources

Previous SASS and TFS surveys already provide a wealth of valuable information concerning the characteristics of both public and private school teachers, their job assignments and the contextual environment of their schools. This information nicely complements the data available from state administrative records regarding the experiences of public school teachers. Research on teachers and teacher career choices also benefit from several publicly available data sources, such as information on the social and economic conditions of states and localities and nationally representative surveys of the population.

The 1986-87 and 1990-91 series of SASS in combination with the 1987-88 and 1991-92 versions of TFS provide researchers an exceptional source of information for examining the substantive issues that motivate the study of teacher supply and demand. The SASS Teacher Questionnaire provides detailed information on each teacher's demographics, current teaching assignment, previous employment experience, educational background, certification, attitudes toward teaching and school governance, future plans,

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and current compensation. The Administrator Questionnaire supplies each administrator's demographics, current administrative assignment, previous experience and assignment in education, educational background, views on potential school problems and school governance, and current compensation. The School Questionnaire furnishes enrollment, school program, and school organization data, student and teacher demographics, community characteristics, staffing patterns, admission criteria, and the employment status of former teachers. The Demand and Shortage Questionnaire reports enrollment, student and teacher demographics, staffing patterns, and certification data, as well as school policies with regard to compensation, teacher hiring and retirement, and graduation requirements. The TFS provides information from one year later on a sample of the SASS Teacher Questionnaire respondents about current teaching assignments, reasons for leaving a position, educational histories, non-teaching employment, family status and income, and career plans.

Many state education agencies maintain a census of certificated personnel employed by the public school districts in the state. These census files contain a unique identifier for every individual (e.g., teaching certificate number, social security number) and several characteristics of the teacher such as sex, age, educational attainment, teaching assignment (e.g., district of employment, grade level, program) and current salary. Some states have retained the information from these censuses over a number of years and the unique identifier makes it possible to follow the careers of teachers as long as they are active in the state's public education system. Our current understanding of the factors that influence the number of years individuals continuously teach in a particular district or state is largely based upon this source of data.

Other administrative records provide invaluable sources of information that can supplement the data maintained in the censuses of certificated personnel. Additional, and often more detailed, data on teacher benefits and salaries are available from state or education association record. Many states also obtain detailed information on a large

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number of characteristics of public school districts. For example, some states that primarily finance public education from state provided funds collect detailed information about local school district revenues and expenditures. In addition, many state administrative data bases include the characteristics of a local district's students such as total enrollments, minority enrollments, the percentage of students eligible for subsidized meals under the guidelines of the National School Lunch Program and standardized test scores.

Nationally representative samples of various populations also provide a potential source of information for increasing our knowledge of the determinants of elementary and secondary teacher supply. Surveys such as the Current Population Survey, the National Longitudinal Survey of the High School Class of 1972, High School and Beyond, and the National Longitudinal Surveys of Labor Market Experiences often include a sizable number of teachers because teaching is one of the most prevalent occupations. These data sources contain very detailed personal characteristics and have proved most useful in describing the experiences of people before they become teachers as well as after they leave teaching. While these samples generally contain several future, current, and past teachers, they rarely include a large enough number of these individuals, or incorporate specific data about the context of a person's teaching position, for detailed examinations of the determinants of teachers' career decisions. We will return to this issue in Section 2.

2. Important Measures Currently Unavailable

Research using the data sources discussed in Section 1 has greatly improved the current state of knowledge concerning the factors that affect the supply of elementary and secondary teachers. However, these data sets do not include measures of certain factors that are essential if researchers are to address a number of portentous issues that limit their ability to provide decision makers with effective policy prescriptions designed to ensure an adequate supply of highly qualified teachers. The rest of this section highlights several

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important issues and discusses the type of measures that NCES should consider in designing the next round of SASS and TFS. The following discussion identifies five areas of interest:

- School-specific information on administration and operations;
- The contextual setting of teachers' current assignments;
- Retrospective information on teaching experiences;
- Labor market experiences of former and returning teachers; and,
- Teachers perceptions of proposed educational reform policies.

These five areas are not meant to be exhaustive but are intended to initiate a discussion among interested parties.

The SASS and the TFS are designed to facilitate comparison between public and private schools and their teachers. Few, if any, states gather data on private schools and their teachers that are comparable to the public school data that are currently available from state administrative records. To the extent possible, the TFS should continue to gather data on (a) private school teacher characteristics (e.g., gender, age), (b) private school teacher salaries, (c) private school expenditures, and (d) descriptors of the organizational, financial, and demographic characteristics of private schools. In addition, the issues outlined in this section are also pertinent to private school teachers.

Recent work on the role school expenditures play in setting the occupational context that sociologists describe as crucial in facilitating the retention of teachers in their positions[1], suggests that school district spending patterns have an important impact on length of stay in teaching.[2] As might be expected, the higher a school district's

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[1] Lortie, D. C. (1975). Schoolteacher: A Sociological Study. Chicago: University of Chicago Press; Waller, W. (1961). The Sociology of Teaching. NewYork: Russell and Russell.

[2] Gritz, R. M. and Theobald, N. D. (1992). "An Economic Model of Teacher Turnover: An Analysis of Public School Teachers in Washington State," mimeograph, University of Washington.

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expenditures for supervisor salaries per teacher, the shorter the predicted duration in teaching. More surprisingly, though, the higher are the expenditures for classified teaching staff (i.e., classroom instructional assistants) in a teacher's program, the more likely an inexperienced secondary teacher is to leave. Over the last 30 years, the fraction of school district employees not classified as teachers has increased from one-third to nearly one-half.[3] While policy makers have assumed that this shift in expenditures from teachers to supervisors, support workers, and classified staff enhances the work of the teaching staff, these data suggest that teachers may not perceive the availability of more non-teachers in their occupational context to be a benefit.

The unit of analysis for such data is the school district. Data aggregated at the school district level cannot address the relative influence of district-specific versus school-specific variables on teacher mobility. Enormous variation exists in the work environments among schools in the same district and considerable evidence has been marshaled to support the influence of school-specific student characteristics on intra-district mobility patterns.[4]

The availability of school-specific data on teacher salaries per pupil and non-teacher salaries per pupil, in combination with currently collected school staffing data, would be useful in assessing the influence of school-specific resource allocation decisions on mobility patterns. Such data would be especially valuable for private schools, since fewer centralized sources of expenditure data exist for non-public schools.

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[3] National Center for Educational Statistics (1990), The Condition of Education: Elementary and Secondary Education, NCES 90-681, Washington, D.C.: U.S. Department of Education.

[4] See, for example, Murnane, R. J. (1981), "Teacher Mobility Revisited," The Journal of Human Resources, 16: 1-19 and Greenberg, D. H., and McCall, J. J. (1974), "Teacher Mobility and Allocation," The Journal of Human Resources, 9: 480-502.

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The 1988-89 TFS highlighted the role administrative decisions play in teacher mobility. Of those former teachers who reported that "dissatisfaction with teaching as a career" was one of their three main reasons for leaving the teaching profession, the main area of dissatisfaction was "inadequate support from administration" (26.4%).[5] An important issue is the precise nature of teacher dissatisfaction with current administrative practices. What does "inadequate support from administration" mean? Do teachers leave the profession because administrators don't support needed student discipline? Do they leave due to inadequate instructional support? Are they referring to financial support? If so, is the primary issue the level of financial support or how administrators allocate the money among competing ends?

The SASS already provides a wide range of information on the contextual setting of teachers' current assignments (e.g., student race, percentage of students qualifying for free or reduced lunches, school staffing patterns). Additional valuable school-specific contextual information that the TFS could appropriately include (a) the number of different students taught per day, (b) hours of paid, school-based, planning and development time (alone and with other educators), and (c) the perceived availability of professional development to address emerging pedagogical challenges (e.g., changing student demographics, an increased focus on higher-order thinking skills and the need to produce reflective, thinking students).

Consideration could also be given to using the SASS to gather school-level data on (a) standardized achievement test scores, (b) instructional expenditures per pupil, (c) dropout rates, and (d) suspension and expulsion rates. In addition, the question of union

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[5] Bobbitt, S. A., Faupel, E., and Burns, S. (1991). Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey, 1988-89. National Center for Education Statistics, NCES 91-128. Washington, DC: U.S. Department of Education.

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membership and the availability of collective bargaining are pertinent district-level variables that are generally not available in state administrative records.

A significant contribution of the current SASS and TFS is the retrospective information on teaching experiences. A key issue overlooked in state administrative files is the extent to which current teachers are products of the "reserve pool" of former teachers. Recent analysis of former teachers shows that one-fourth of those who leave teaching eventually return to the profession.[6] While the SASS gathers data on the numbers of breaks in service a teacher has experienced, the issue of how long each of these breaks were is not addressed. Alternately, the SASS supplies information on the main activity of each teacher in the year before they began teaching in the school. For those teachers who have returned to teaching, it may be useful to ask when the teacher began this activity. Since the reserve pool is the primary source of teacher supply in a number of states, including Washington[7], the length of time returning teachers remain outside the profession provides insight into the contribution researchers can expect former teachers to make to a state's supply of teachers.

In a similar vein, state administrative data sets contain little or no information on the employment histories of teachers once they leave the state education system. Additional information on the labor market experiences of former and returning teachers could be quite useful. Specifically, information on the usual number of hours worked per week and the number of weeks worked per year could be useful in assessing alternative wages available outside of teaching. Other useful data could include the availability of full, partial, or no health and retirement benefits and the provision of other perquisites such as life insurance.

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[6] Murnane, R. J., Singer, J. D., Willett, J. B., Kemple, J. J., and Olsen, R. J. (1991), Who Will Teach?: Policies That Matter, Cambridge, MA: Harvard University Press.

[7] Theobald, N. D. (1987), Who will teach our children?, Olympia, WA: Office of the State Superintendent of Public Instruction.

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The type of information reported in the Annual Demographic File of the U.S. Bureau of the Census' March Supplement to the Current Population Survey is an example of what could be useful in this area.

Finally, a huge issue is the inaccessibility of information measuring teacher ability or quality. While the current TFS does not seem to be an appropriate instrument for directly addressing this issue, the perceived effect of various educational reform policies on the retention of good teachers could be included in Section III (Your Opinions). For example, in his most recent book[8], Ted Sizer asserts that improvement in the quality of education provided by America's public schools is sustainable only when individual sites decide what is to be taught and how it will be assessed. This view, though, runs counter to current policy thrusts to establish national goals and a national examination system. Sizer observes that good teachers in the schools with which he is familiar take great pride in knowing their students better than anybody else and he worries that the more state and national policy makers claim greater knowledge as to what these teachers' students should learn, the more likely good teachers are to leave the profession and the less likely they are to enter in the first place. The TFS could collect teacher views on this potentially important issue.

Also, the TFS could gather data on the extent to which teachers participate in mandated student testing and the stakes involved. The New Standards Project, whose participants include states and school districts educating approximately one-half of the nation's students, is committed to the position that children will not sit for assessments unless their teachers have participated in the creating and scoring of them. Are the teachers responding to the TFS involved in building and scoring these assessments? Do they agree that a national system of examinations is the most promising place to allocate limited

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[8] Sizer, T. R. (1992). Horace's School: Redesigning the American High School. Boston: Houghton Mifflin.

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funding for reform? If not, what other interventions do they believe could have more impact and a greater chance of being effective?

3. Additional Data Collection

Current research on teachers and teacher career choices views college students who are choosing what occupation to enter, and teachers who are deciding whether to continue teaching, as rational individuals who respond to the opportunities available both in and out of teaching. Little data is available, though, on the initial process of what determines who goes into teaching.

Murnane et al. report that the higher the salaries in teaching relative to those in other occupations, the more graduates choose to teach.[9] Relative salaries are not the only determinant of labor market decisions, though. Teacher labor market decisions are also influenced by the attributes of alternative jobs--both what one does in different jobs, and the conditions under which one works. It may be that the opportunities to make a notable contribution at a young age may be extremely important in inducing bright college graduates to teach.[10]

An initial survey of individuals enrolled in teacher education programs that addresses why they are preparing to teach could provide valuable insights into what attracts individuals to teaching. A longitudinal followup survey of these individuals asking why they entered, or did not enter the profession, could be quite valuable for future work on teacher career decisions. Greater understanding of college students' decisions to enter teaching may contribute substantially to our ability to provide a framework decision makers

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[9] Murnane, R. J., Singer, J. D., Willett, J. B., Kemple, J. J., and Olsen, R. J. (1991). *Who Will Teach?: Policies That Matter*. Cambridge, MA: Harvard University Press.

[10] Murnane, R. J. (1987). "Understanding Teacher Attrition," *Harvard Educational Review*, 57: 177-182.

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can use in formulating policies that will proactively influence the career decisions of elementary and secondary school teachers.

Teacher Retention/Attrition: Issues for Research

Prepared for the National Center
for Education Statistics

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Teacher Retention/Attrition: Issues for Research

In this paper, I identify teacher retention and attrition issues by providing a synopsis of prior research findings and by suggesting ideas for future research. This is not an exhaustive review of the attrition/retention literature, but rather a selective overview of major research findings. I also address job satisfaction and commitment, which have been linked to career decisions.

In the teacher attrition/retention literature, many different terms and definitions have been used, such as transfer, exit, and turnover. There is little agreement about what is meant by these terms and researchers do not use these same terms consistently. This paper incorporates findings from studies that have used various definitions of attrition (e.g., attrition from one school district to another, attrition to non-teaching positions, transfer from one teaching field to another). The past SASS questionnaires allow for investigations of different types of attrition. This is important, because as Grissmer and Kirby (1987) emphasize, there is "no single appropriate definition of teacher attrition. Indeed, one cannot define teacher attrition until one defines the policy or research context in which a particular definition will be used" (p. 7).

Much of the research on teacher attrition/retention has been piecemeal (Chapman, 1983; Grissmer & Kirby, 1987) and rarely have researchers used a comprehensive model or framework to guide their studies. Past research results suggest that a wide variety of variables influence teachers' career decisions. In a recent review of the literature focusing on special educators' career decisions, I proposed a conceptual model of teacher attrition/retention (see Billingsley, in press). The model shown in Figure 1 suggests that career decisions are influenced by "external," "employment," and "personal" factors. The relationship between these factors and teachers' career decisions is complex and involves numerous interactions. A basic assumption of the model is that the factors influencing teachers' career choices "are not static, but evolve over the lifecyle, reflecting changing priorities, needs, interests, and options" (Billingsley, in press, p. 51). In the following three sections of this paper I review each aspect of the model, briefly summarize major research findings related to each, and identify specific issues for research.

External Factors

External factors include institutional, societal, and economic variables that have an indirect effect on teachers' career decisions by influencing employment and personal factors. For example, during depressed economic times, teachers have fewer job opportunities elsewhere and stay in positions for longer

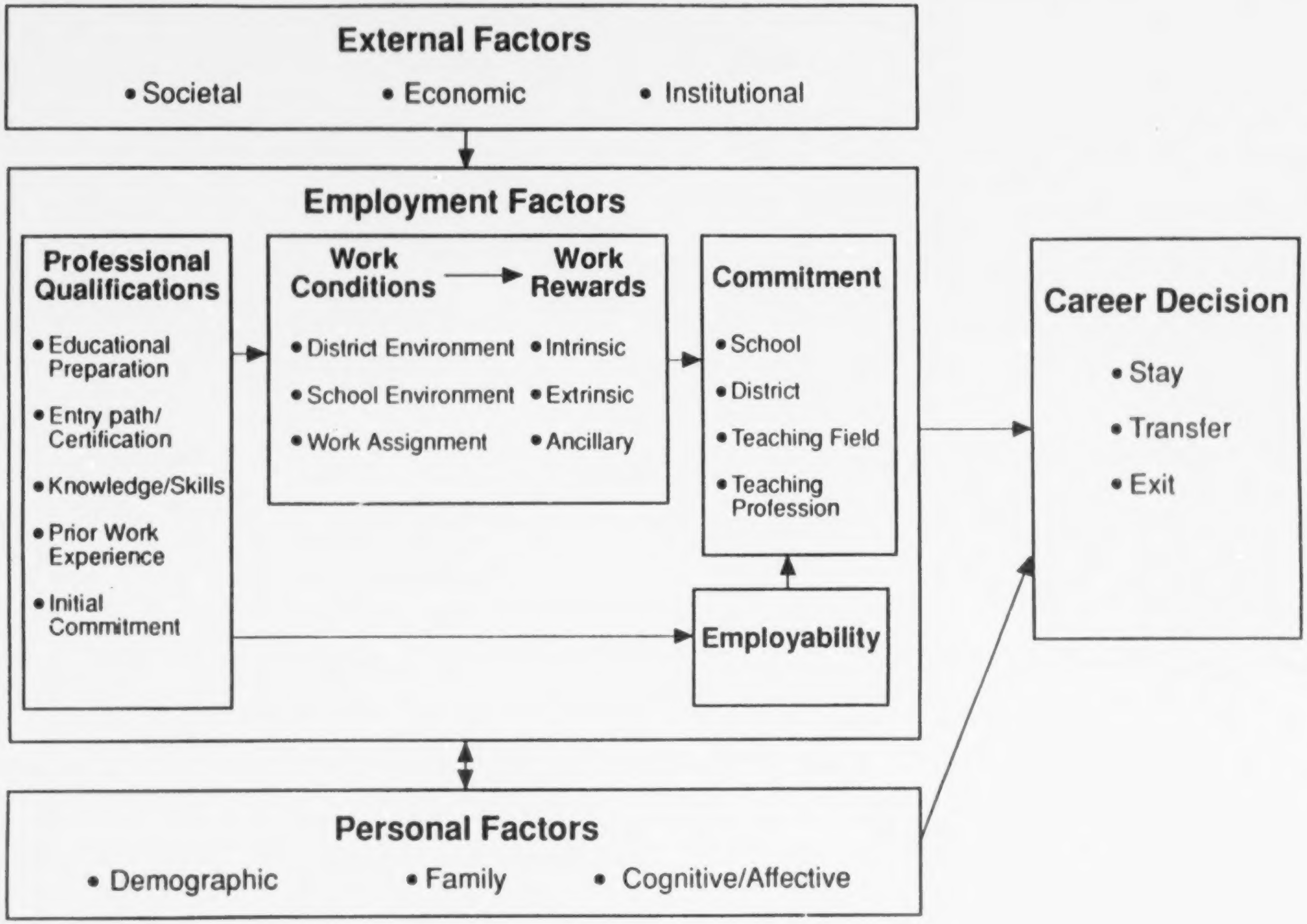
External Factors
• Societal
• Economic
• Institutional
Employment Factors
Professional Qualifications
• Educational Preparation
• Entry path/ Certification
• Knowledge/Skills
• Prior Work Experience
• Initial Commitment
Work Conditions
Work Rewards
• District Environment
• School Environment
• Work Assignment
• Intrinsic
• Extrinsic
• Ancillary
Commitment
• School
• District
• Teaching Field
• Teaching Profession
Employability
Career Decision
• Stay
• Transfer
• Exit
Personal Factors
• Demographic
• Family
• Cognitive/Affective

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Figure 1. A Conceptual Model of the Influences of Teachers' Career Decisions (Billingsley, in press).

periods. Societal influences on teachers' career decisions include many different variables, such as cultural values and community characteristics. Some teachers may leave because of the lack of prestige associated with teaching or the location of the school in a violent community. Institutional factors include colleges and universities, teacher unions, and federal and state education agencies. Strong teacher preparation programs may increase teachers' commitment and skills, resulting in greater teaching longevity. State education requirements and teacher unions may indirectly influence teachers' career decisions through modifying the conditions of work (e.g., regulating class size).

Little is known about the effects of these external factors on teachers' career decisions. Isolating the effects of these factors on career decisions cannot be accomplished by gathering data from teachers alone in some cases. However, the use of teacher data in combination with other data (e.g., economic data) provide the information needed to investigate the influence of external factors to teacher attrition/retention.

Future research should consider the relationship among variables such as job satisfaction, attrition/retention and:

- economic conditions over time, and
- various state policies (e.g., certification requirements, class sizes)

Employment Factors

Figure 1 suggests that several major employment factors influence teachers' career decisions. These include professional qualifications, work conditions and rewards, employability, and commitment.

Professional Qualifications

Figure 1 indicates that several professional qualifications may influence teachers' career decisions, including knowledge/skills, educational background, entry path and certification status, prior work experience, and initial commitment.

1. Teacher knowledge/skills

No studies were found that directly investigated teachers' effectiveness and career decisions. However, several researchers have used test results (i.e., National Teacher Exam [NTE], Scholastic Aptitude Test [SAT]) to assess the relationships between academic talent/achievement and career decisions. Academically talented teachers were found to leave teaching in higher proportions than their less able counterparts in several studies (Frank & Keith, 1984, Murnane, Singer, & Willett, 1989; Schlechty & Vance, 1981; Singer, 1992). However, it is important that NTE and SAT scores not be used as indicators of teacher effectiveness. Therefore, other types of measures need to be considered when investigating the relationship between teacher quality and career decisions.

Although past SASS questionnaires include items on special training, certification status, and academic background, other proxies for teacher quality need to be considered. Future studies should consider the relationship among variables such as job satisfaction, career decisions and:

- professional involvement, which includes both effort (e.g., motivation, enthusiasm) as well as teacher self-efficacy, and
- teacher commitment (to be explored later in this paper).

2. Teaching preparation

Few conclusions can be drawn from studies investigating the relationship of teachers' career decisions and degrees held (e.g., bachelors, masters) and certification status. Probably more important than credentials held are measures of preparation variables. Sweeney, Warren, and Kemis (1991) found that some preparation variables significantly contributed to the prediction of whether teachers remained in teaching after five years. They found that graduates who stayed were more satisfied with their student teaching experiences and rated specific aspects of their preparation (e.g., planning and delivering instruction and perceived adequacy of preparation in classroom management) higher than those who exited teaching. Page, Page, and Million (1983) found that first-year teachers' self-assessment of the quality of their teacher preparation experience on specific instructional variables (e.g., preparation to work with parents) was predictive of plans to stay in teaching.

The trend toward alternative certification programs creates new opportunities for those trained in other fields to enter teaching. Some of these teachers may be older and have had one or more careers prior to entering teaching. The question of whether teachers entering through these alternatively prepared routes are more likely to stay or leave than traditionally prepared teachers is a question requiring further study.

Future studies should consider the relationship among variables such as job satisfaction/career decisions and:

- traditional/nontraditional education preparation routes
- specific characteristics of teacher preparation programs (four year versus five year; the degree of field experiences provided; competency based programs, extent and quality of field experiences);
- early career support (e.g., nature of teacher mentor programs, followup support from universities);
- perceptions of the extent of preparedness on specific dimensions (e.g., behavior management, working with diverse student populations); and
- early versus late career entrants

3. Work experiences

Prior research indicates that inexperienced teachers are more likely to leave teaching than are experienced teachers (Grissmer & Kirby, 1987; Heyns, 1988; Mark & Anderson, 1985; McKnab, 1983; Metzke, 1988; Singer, 1992; Seery, 1990; Theobald, 1989). Yet, little is known about the influences of the teachers' commitment to teaching over time. Ideally, to understand the development of teachers' commitment, data would be gathered prior to the first teaching position and continue over time. It is likely that experiences at the preservice level as well as later career experiences influence teachers' career decisions. The influence of non-teaching career activities might also be considered.

Future studies should consider the relationships among variables such as job satisfaction, career decisions and:

- early career experiences (both teaching and non-teaching), and
- other types of involvement in educational settings (e.g., volunteering, work in paraprofessional roles).

4. Initial commitment

Some teachers enter teaching because of an attraction to the work of teaching while others enter for more casual reasons and do not expect to stay a long time (Yee, 1990). Understanding the reasons for entering teaching and the extent of initial commitment are variables for further study. Ideally, data regarding initial commitment would be gathered prior to the first teaching experience rather than through retrospective appraisal.

Work Conditions and Work Rewards

Numerous work variables have been associated with teachers' career decisions, yet there are few consistent findings across studies. Figure 1 shows that the rewards teachers experience relate to their work conditions. Three levels of work conditions (e.g., district, school, assignment) are hypothesized to influence career decisions.

1. District and school environments

Districts with higher levels of teacher commitment tend to be smaller, have higher per-pupil expenditures, employ teachers with higher educational attainment from higher status universities, and appoint rather than elect their superintendents (Rosenholtz, 1989). Theobald (1989) reported that decisions to continue in teaching in the same district the following year were related to pupil-staff ratio and assessed valuation per pupil. As expected, he found that large staff-pupil ratios were detrimental to teacher retention. Unexpectedly, Theobald (1989) found that teachers in "wealthy", high valuation districts were more likely to leave than comparable teachers elsewhere, when other factors were held constant.

The district and school "climate" is also a variable for consideration. Lack of administrative support has been associated with intent to leave and attrition among teachers in a number of studies (Billingsley & Cross, 1991, 1992; Cross & Billingsley, in press; Bloland & Selby, 1980; Metzke, 1988; National Center for Education Statistics, 1991; Platt & Olson, 1990). Administrative support is a multi-dimensional concept that includes different levels of support (e.g., central office and building level) and many different kinds of behaviors. The global measure of administrative support used in some attrition/retention studies makes it difficult to identify the specific aspects of support that are important to an overall perception of support and retention/attrition. Better conceptualizations of support need to be included in future studies.

Another related variable of interest is the effect of district and school leadership on teachers' career decisions and attitudes. Little is known about the influences of restructured educational systems in which teachers have more autonomy and decision-making responsibilities. For example, what effects, if any, does a site-based management approach versus a traditional administrative-teacher relationship have on teacher attitudes and retention? Also, does the presence of other district administrative structures (e.g., school choice, merit pay, career ladders) enter into the satisfaction and commitment of teachers?

Other types of support such as the extent of colleague support and interaction and parent involvement and support are also of interest. Research results on the relationship between colleague and parent support and teachers' career decisions have received little attention and the results are mixed (Chandler, 1983; Davis, 1983; George, George, & Grosenick, 1992; Platt & Olson, 1990).

Separating the effects of other district and school variables on teachers' career decisions is challenging since both influence teachers' daily work lives. Future studies should consider the relationship among variables such as job satisfaction/career decisions and:

- district and school climate;
- personnel policies (e.g., merit pay incentives, benefits);
- specific types of administrative/leadership behavior (e.g., support, site-based management);
- parent and colleague support;
- opportunities for growth and development;
- teacher influence over school policies;
- career ladders and other forms of staff differentiation.

2. Teaching assignment

Teachers' work assignments include their immediate work environment (e.g., classroom) as well as the activities and interactions that occur in the classroom. Variables such as student characteristics, number of students taught, students' commitment to learning, degree of role clarity, teaching and non-teaching responsibilities would be included in this category. The district and school-related factors outlined earlier may directly or indirectly influence teachers' work assignments through the assignment of students and duties and the amount of support the teacher receives. The effects of varied assignment variables to attrition/retention have received little attention. For example, it is not known whether teachers who remain experience fewer role problems than those who leave. Another question is the relationship between "behavioral" work assignment factors (e.g., student/teacher ratio, high minority enrollment, actual work responsibilities) and "affective reactions" to the conditions of teaching (e.g., satisfaction with teaching). Are differences between stayers and leavers due to the actual conditions of work or to their reactions to them? There might also be differences in the effect of work problems on teachers at different career stages. Difficult work circumstances may be more likely to contribute to decisions to leave early in the career. Future studies should consider the relationship among variables such as job satisfaction/career decisions and:

- teachers' perceived and actual role demands;

- characteristics and number of students taught;
- students' commitment to learning;
- early career experiences.

Work Rewards

Lortie (1975) posits three major types of work rewards, intrinsic, extrinsic and ancillary. However, intrinsic rewards are perhaps the most important. A number of researchers have reported that teachers with higher salaries were more likely to continue (Darling-Hammond, 1984; Murnane et al., 1989; Schlechty & Vance, 1983; Singer, 1992; Theobald). The SASS has a fairly comprehensive section regarding monetary compensation, but the incorporation of additional ancillary and intrinsic reward items is needed.

Future studies should consider the relationship among variables such as job satisfaction/career decisions and:

- teachers' perceptions of meaningfulness of work (e.g., making a difference in students' lives, perceptions of student progress;
- importance of varied work rewards;
- teachers' self-efficacy;
- convenience of work locations, hours, and
- teachers' expectations.

Employability and Commitment

Figure 1 also posits that career decisions are influenced by the teacher's perceived employability elsewhere as well as their commitment to the organization and/or profession. Some teachers who want to leave teaching cannot because they do not have skills valued by industry (Dworkin, 1985) or there is little opportunity for other teaching positions. Rosenholtz (1989) indicates that some teachers stay in teaching because they have few other desirable options; these teachers may be unhappy and unmotivated, and thus put little effort into their teaching. Others may not be as committed to staying in their current jobs because of a variety of other opportunities.

It is thus important to determine how committed teachers are to their profession/organization. Commitment has been defined in a variety of ways, reflecting behavioral intent to stay or attitudes about the profession/organization. Mowday, Porter, and Steers (1982) proposed the mostly widely used definition of commitment. They suggested that commitment includes at least three factors: (a) a strong belief in and acceptance of the organization's/ profession's goals and values; (b) a willingness to exert considerable effort on behalf of the organization/profession, and (c) a strong desire to maintain membership in the organization/profession.

Figure 1 portrays several types of commitment, which includes commitment to school, district, teaching field, and teaching. Teachers may be committed in some ways, but not others. For example, a teacher may be committed to remaining in their teaching field, but feel little commitment to the school organization. Gathering data on the various types of commitment may be helpful to understanding differences in attrition rates among various teaching fields, schools, and districts.

Commitment is associated negatively with withdrawal behaviors such as decreased effort, absenteeism, and turnover (Mowday, et al., 1982; Reichers, 1985). However, less is known about the antecedents of commitment.

Future studies should consider:

- the relationship among career decisions and employability and commitment;
- the influences of teacher preparation and work conditions on various types of commitment, and
- influences on commitment over time.

Personal Factors

1. Demographic and family variables

Recent demographic studies conclude that women are more likely to leave teaching than men (Heyns, 1988; Murnane et al., 1989; Singer, 1992) and that teacher attrition patterns vary over the life cyle, with higher attrition among younger teachers (Grissmer & Kirby, 1987; Metzke, 1988; Murnane et al., 1989; Singer, 1992) and older teachers nearing retirement (Grissmer & Kirby, 1987). Grissmer and Kirby (1987) indicate that attrition follows a U-shaped curve over the life cycle. Attrition is high among younger teachers during the early years of teaching, low for middle-aged teachers, and high again as teachers become eligible for retirement. Theobald (1989) reported an interaction between gender and age, with younger women more likely to leave than younger men, and older women less likely to leave than older men. Recent findings indicate no relationship between race and teacher retention (Heyns, 1988; Singer, 1992; Theobald, 1989).

During the early years of teaching personal and family changes such as marriage, maternity, and relocation have been frequently cited as reasons for teacher attrition from districts and teaching (Grissmer & Kirby, 1987). Many teachers leave teaching and return (Murnane, Singer, & Willett, 1988; 1989; Singer, in press). Some teaching interruptions are likely due to pregnancy and decisions to remain at home with young children.

Additional studies should consider possible interactions among demographic and family variables in understanding retention/attrition patterns. For example:

- What is the relationship between different family structures (e.g., single-parent families, dual income families, two parent, one breadwinner families) and teacher retention/attrition?
- Are there interactions between different family structures and other variables (e.g., race, family incomes) influencing teacher retention/attrition?

2. Personal variables

Cognitive and affective variables (e.g., motivation, personality, interest, expectations, ability) may influence teachers' career decisions, although little is known about them. Chapman and Hutcheson (1982) reported differences in teachers' retention/attrition decisions based on their values. They reported that among teachers who leave, autonomy, job challenge, and monetary rewards were deemed most important. Teachers remaining were more oriented toward interpersonal rewards.

Psychological models of retention/attrition suggest that a number of "pre-entry" variables may influence career decisions (Mueller & Price, 1990). Variables such as personal expectations, plans to remain in a community, participation in community activities are included in psychological models of turnover. Other variables such as personal variables, locus of control and stress hardiness also deserve further exploration.

Conclusions

The above conceptual framework provides a wide array of possible variables for study. Although many of these variables are of potential interest, some will be of more interest than others, depending upon the purposes of the study. From a supply/demand perspective, it is important to understand how a broad range of factors influence teachers' career patterns over the teaching career. From a teacher quality and retention perspective, I believe that two important areas are in need of additional emphasis.

First, a central focus should concern work-related variables. Work-related variables are arguably most amenable to change. Further, a better understanding of the influences of teacher commitment and satisfaction may do more to improve the quality of the workforce than the study of many other variables. However, one of the problems in studying the influence of work-related variables on teacher retention/commitment is in isolating the effects of so many potential independent variables, many of which are highly correlated.

Second, understanding which preservice and induction factors contribute to teaching longevity also deserve emphasis since teachers are at particular risk of leaving during the early career period. Over the last decade states, districts, and institutions of higher education have implemented programs to enhance teachers' growth during the early career period. Understanding how these programs influence teachers' induction need to be explored.

Additionally, although SASS gathers data on why teachers leave, they also should consider why teachers return. As others have found, many teachers who leave eventually return (Heyns, 1988; Murnane, et al. 1988, Singer, in press). Understanding teachers' reasons for returning should provide a more comprehensive assessment of their career paths.

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REFLECTIONS ON A SASS LONGITUDINAL STUDY

Iris R. Weiss

December 1992

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Follow-ups of the first two SASS cohorts focused on a number of important issues related to teacher retention, including satisfaction with teaching and ways to retain teachers in the profession. I believe an on-going longitudinal study should retain this focus. In particular, if the sample of new teachers is large enough we would get an opportunity to watch how teaching careers unfold, including satisfaction and concerns over time, and breaks and returns from teaching.

Other issues that seem important for the longitudinal study relate to the perceived adequacy of teacher education and support systems (including pre-service preparation, induction-year and other mentoring programs, in-service education, and professional networks); the teacher's role as a member of the school and larger professional community; and participation in/attitudes toward educational reforms. Each of these areas is discussed briefly below. Some of these issues are already addressed in the baseline survey; if others are included in the follow-ups, they should be added to the baseline survey as well.

Teacher Preparation and Support

Pre-service education is aimed at providing prospective teachers with both a solid content background and a working knowledge of their craft. Considerable concern has been expressed about the lack of in-depth subject matter preparation on the part of many teachers, and there is some evidence, at least at the elementary level, that teachers share this concern. In addition, there are indications that new teachers are poorly prepared for the realities of the classroom. Longitudinal data from the Metropolitan Life Survey of the American Teacher indicate that many new teachers enter the classroom believing that they can really make a difference in the lives of their students, but they become disillusioned over the course of their first year. The high attrition rates for teachers in the first years of teaching provide further evidence that teachers either do not know what they are getting themselves into and/or are inadequately prepared to deal with it.

A longitudinal study would provide the opportunity to track teachers' perceptions of the adequacy of their pre-service preparation for helping them face a number of the challenges of teaching over time. It may be, for example, that pre-service content preparation is adequate for the first few years but that teachers feel that their knowledge is increasingly obsolete, especially in rapidly changing fields such as the sciences. Or teachers may feel that their mostly theoretical content courses did not provide them with the knowledge of applications of the content that would be of interest to their students. Their feelings of adequacy in this area may increase over time as they accumulate examples of applications from the professional literature, from in-service programs, and from their colleagues. Similarly, pre-service preparation may not adequately prepare teachers to teach students from a variety of backgrounds; some may learn "on the job" while others may continue to feel inadequate to the task.

> I envision a series of items asking teachers how well prepared they feel in a number of areas (e.g., content knowledge; understanding of diverse learners, including strategies for ensuring participation and success of all students; strategies for classroom organization and management, ability to identify student misconceptions, familiarity with a range of curriculum options) and the utility of each of a number of sources in preparing them for that area. How well prepared do you feel to ...? How helpful has each of the following been in preparing you to ... (pre-service courses; other college courses; in-service programs; other teachers in my school). Item construction will be tricky because there is a single questionnaire for teachers of all grade levels and disciplines. It might be advisable to relate this series either to the field they indicate they are best qualified to teach or their primary assignment field, both to give teachers a reference point for responding and to give analysts a shot at disaggregating by subject if sample sizes permit.

Leadership Development

A longitudinal study offers the opportunity to watch teachers' professional development over time, including the extent to which they take leadership roles in their school, district, state, and nationally. Initially one would expect teachers to focus almost exclusively on teaching their classes; professional interactions might be limited to learning "survival skills". As the teacher masters the tasks involved in classroom teaching, he/she might begin to participate more actively in school and district-wide activities such as curriculum development and textbook selection committees. Some might become active in professional organizations and/or take a leadership role in planning and implementing in-service programs for their colleagues. A few will become prominent in their state or even nationally, winning awards, or serving on task forces. It would be interesting to compare the professional development patterns of teachers in small and large schools and school districts, where opportunities to provide leadership would be expected to vary, and in rural, urban, and suburban settings, where the length of time it takes to master the survival skills might be quite different.

> I envision a series of items asking teachers if they had participated in each of a number of activities in the period since the last survey. There might be two sets of items, one with yes- no options (e.g., did you receive an award) and one with a set of response options to gauge the extent of their involvement.

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Experience with Educational Reform

The last decade has been a period of intense discussion of the need for educational reform; teachers have been faced with a bewildering, and sometimes contradictory, set of recommendations. There is some anecdotal evidence that reform is a dirty word to many teachers; they are tired of "people with Ph D's who haven't set foot in a classroom for 30 years" coming up with what teachers consider to be impractical solutions to problems the reformers don't fully understand. On the other hand, recent reform rhetoric tends to focus on changing the system. Rather than blaming teachers, a number of the more systemic reforms emphasize the need to provide time for teachers to plan and collaborate; reform is something teachers can and will do if given the opportunity, not something that has to be done to them. It would be important to know how teachers feel about reform efforts; what they see as the key areas for change; whether they are involved in implementing particular reforms; and whether they are actively embracing, tolerating, or subverting these efforts.

> Likert-scale items can be used to assess teachers' participation in and attitudes toward reform generally (and toward generic reforms such as site-based management), and to determine if they see the reforms they are asked to carry out as generally consistent. It will be more difficult to find out about subject-specific reforms, but probably worth the effort. If we were designing the questionnaire now I would focus on efforts to create national curriculum standards, asking teachers to indicate their current status with regard to standards in each discipline that they teach. (Possible response options: I'm not aware of national curriculum standards in this area; I'm aware of the standards, but I don't know much about them; I'm well aware of the standards but have not begun to implement them; I'm working on implementing the standards.) I'm guessing that we will continue to want to track standards implementation for the next decade; other "hot" items could be added (or substituted) as the reform agenda evolves.

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WHITHER DIDST THOU GO?
RETENTION, REASSIGNMENT, MIGRATION, AND ATTRITION OF SPECIAL AND GENERAL EDUCATION TEACHERS IN NATIONAL PERSPECTIVE

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WHITHER DIDST THOU GO? RETENTION, REASSIGNMENT, MIGRATION, AND ATTRITION OF SPECIAL AND GENERAL EDUCATION TEACHERS IN NATIONAL PERSPECTIVE[1]

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Abstract

In view of the paucity of national data on teacher retention, transfer, and attrition in special education, and the importance of these phenomena to teacher demand and shortage, this research provides such data from a national probability sample of 4,798 public-school teachers from the 1989 Teacher Followup Survey. The analysis focused on two main teaching fields (special and general education) and various aspects of teacher turnover. Results showed significantly higher annual turnover for special education teachers (SETs) than for general education teachers (GETs), both in terms of attrition (SETs = 8%; GETs = 6%) and of school transfer (SETs = 12%; GETs = 7%). However, SETs and GETs who left teaching did not differ significantly in post-teaching activities and plans to return to teaching. With respect to turnover, teachers of learning disabled students were more similar to GETs than were other SETs. Implications of teacher turnover for teacher demand, shortage, recruitment, retention, and education are discussed.

Introduction

Teacher turnover in public schools is a significant factor undermining program stability and quality. Unfortunately, there is a reasonably high annual turnover of the teaching staff of public schools with some teachers being reassigned to another school within the district, some migrating to teaching positions in other districts, and others leaving public school teaching for other pursuits (i.e., attrition). However, the degree to which such year-to-year change occurs, the status of teachers in the year after leaving a school, and related differences between special and general education teachers are virtually unknown from a national perspective. There is considerable evidence that turnover in special education is greater than in general education (e.g., Bobbitt, Faupel, & Burns, 1991; Billingsley, 1993; Boe, Cook, Kaufman, & Danielson, 1993), a phenomenon magnified by the additional loss of special education teachers (SETs)[1] through transfer to general education (Billingsley & Cross, 1991; Schrag & Theobald, 1989). Consequently, a better understanding of the dynamics of year-to-year changes in the national teaching force in special education would be of considerable benefit to education policy makers, administrators, and others who are concerned with problems posed by teacher turnover.

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[1] In addition to SETs, two other categories of teachers are abbreviated for simplicity. One is for general education teachers (GETs), and the other for teachers of students with learning disabilities (LDTs).

With respect to the reassignment and migration components of teacher turnover, Choy, Medrich, Henke, and Bobbitt (1992) reported, based on the 1989 Teacher Followup Survey (TFS) of the National Center for Education Statistics (NCES), the U.S. Department of Education (USDE), that approximately 14% of SETs transferred to a different public school following the 1987-88 school year. Though this number combines teachers who were reassigned to a school in the same district and those who migrated to a different district, the 14% figure is about twice the percentage of SETs who leave teaching entirely as reported by Bobbitt et al. (1991) using the same national data base. Thus in total, a remarkably high 21% of SETs in one year left the school (i.e, turned over) in which they had been teaching.

The only state data reported on school transfer of teachers pertains to migration to a different district within Wisconsin (Lauritzen & Friedman, 1992). The Wisconsin data showed migration of only 1.1% for general education teachers (GETs) and a slightly higher 1.7% for SETs. Though these percentages are low compared to the 14% for special education reported by Choy et al. (1992) for the nation as a whole, the figures are not directly comparable because the latter percentage includes within-district reassignment as well as migration.

With respect to the attrition component of teacher turnover, comprehensive reviews of the literature in special education have appeared elsewhere (Billingsley, 1993; Brownell & Smith, 1992). The most recent national estimate indicated that 7.3% (or about 17,500) SETs leave the profession annually (Bobbitt et al., 1991, reporting data for the 1987-88 school year based on the 1989 TFS). In contrast, the attrition percentage for all teachers combined was 5.6%. Since total teachers include SETs, the attrition percentage for general education teachers (GETs) would therefore be somewhat less than 5.6%. Since these are the only reliable national attrition estimates during the past two decades, no national trend in attrition percentages is known.

Relatively recent data about attrition of SETs are available from Wisconsin, Kansas, and Michigan. For Wisconsin, Lauritzen and Friedman (1992) reported a steady decline in attrition percentages of SETs from 10.8% for the 1984-85 public school teaching force to 6.8% for the 1990-91 teaching force. Although attrition percentages for GETs also generally declined during these years, the SET attrition percentages were about 50% higher than for GETs. These attrition percentages include the transfer of SETs to general education and migration to out-of-state public schools, facts which increase the attrition percentages reported in comparison with percentages limited to exit attrition (i.e., leaving the teaching profession). However, the attrition percentages from Lauritzen and Friedman are based only on SETs with regular licenses (attrition of SETs with emergency licenses were excluded for this purpose), a fact which almost certainly resulted in a lower attrition percentage than would have been found if teachers practicing with emergency licenses were included. These subtleties illustrate the complexity of attrition data, which creates difficulty in comparing the findings of various studies of attrition. Limitations of data bases and the absence of a standardized conceptual framework make cross-study differences inevitable.

A similar trend in attrition percentages for public school SETs in Kansas has been reported by McKnab (1993). Attrition percentages based on all SETs (regular and emergency certified) in Kansas gradually declined from 15.4%[2] for 1984-85 to 8.6% for 1992-93. These attrition percentages also include transfer of SETs to general education and out-of-state migration. Attrition data for GETs were not reported.

Even though Parshall (1990) reported much lower attrition percentages for both SETs and GETs in Michigan, nonetheless the attrition percentages for all public school SETs declined from 1986-87 (4.2%) to 1988-89 (3.6%). As in Wisconsin, GET attrition percentages also declined during this period, but SET attrition was about 50% higher than for GETs. The Michigan attrition percentages likewise include transfer of SETs to general education and out-of-state migration.

Finally, little is known about the magnitude of the loss of teachers from special education to general education (i.e., cross-field attrition). According to Schrag and Theobald (1989) who studied this phenomenon in the State of Washington, over 5% of SETs transferred to general education following the 1986-87 school year. Reasons for special to general education teacher transfers were studied in 286 SETs by Billingsley and Cross (1991) in Virginia. In general, these teachers left special education for general education teaching ". . . because of administrative factors and the stress involved in working with special education students" (p. 507).

The review of available attrition data presented above is consistent in showing that the attrition percentages, which unfortunately combined several major components of teacher turnover, have declined considerably for both SETs and GETs from the mid-1980s to the early 1990s. Yet attrition of SETs is consistently higher than that of GETs. Unfortunately, the state data reported on special education attrition incorporates four major components of attrition into one figure; namely, leaving the profession, migrating to out-of-state schools, transferring to private school teaching, and transferring to a teaching specialization in general education. Consequently, these data do not provide a clear picture of the status of teachers in the profession during the time periods under study. The only way to obtain precise information about the components of teacher retention, transfer, and attrition is to use a data base that permits tracking of teacher transfers across schools, districts, and state boundaries, across the public and private sectors, across teaching specializations, and out of the teaching profession.

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[2] P. McKnab, personal communication, October 25, 1993.

The objectives of this research were to provide, for the first time, (a) nationally estimated numbers of teachers for each component of retention and turnover of SETs in the public sector, and to identify how special and general education teachers are similar or different in these respects, (b) information about plans of SET and GET leavers to return to teaching, and (c) parallel information for teachers of students with learning disabilities (LDTs) and all other SETs.

It should be noted that turnover and attrition are not synonymous in themselves with teacher shortages, though exit attrition and transfer attrition to general education could result in shortages of SETs. An analysis of sources of supply and shortages of SETs is presented by Boe, Cook, Kaufman, and Danielson (1993).

Method

The research reported here is based on the Public School Teachers Questionnaire of the 1987-88 Schools and Staffing Survey, and the subsequent Questionnaires for Current Teachers and for Former Teachers of the 1989 Teacher Followup Survey, all conducted by NCES. The design of these surveys provides for representative estimates of the numbers and attributes of teachers in the U.S. in both public and private sector schools.

The Schools and Staffing Survey (SASS)[3]

SASS was first administered to national probability samples of teachers, principals, schools, and public sector school districts during the period January through May of 1988. A stratified systematic probability proportionate-to-size selection procedure was used to draw the SASS sample. The size of the teacher sample in public schools was 46,928. The sample design permits national estimates for both special and general education teachers at the elementary and secondary levels in the public sector, as well as for many other variables.

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[3] A complete technical description of this survey is provided by Kaufman (1991), much of which is presented here in condensed form in Appendix A. A briefer, less-technical description is found in Boe and Gilford (1992, Appendix B). Copies of survey questionnaires are available from NCES.

SASS was composed of four basic questionnaires, with minor variations for units in the public and private sectors. The sample sizes for the four questionnaires used in the public sector, along with specification of the units sampled, are shown in Table 1. SASS questionnaires were administered by mail, with extensive telephone followup. Consequently, questionnaire response rates were quite high--a weighted response rate of 86.4% for the Public School Teachers Questionnaire (Kaufman, 1991, p. 2).

SASS was designed so that schools were the primary sampling unit. Once a school was selected for the sample, the principal of that school was selected for the School Administrator Questionnaire and a sample of four to eight teachers from that school was selected for the School Teachers Questionnaire. In the public sector, the district in which the school was located was selected for the Teacher Demand and Shortage Questionnaire. This design, therefore, permits the linking of data from one questionnaire to another. For example, teachers' perceptions of school climate can be compared with similar perceptions of the principals of their schools.

The Public School Teachers Questionnaire was the only component of SASS used in this research. It concentrated on their current teaching status, teaching experience, training and other qualifications, current teaching load, perceptions and attitudes toward teaching, compensation and incentives, and demographic and socioeconomic characteristics.

Teacher Followup Survey (TFS)[4]

TFS was administered during the period of March through July of 1989 (one year after SASS) to samples of teachers that had been included in the SASS sample of teachers during the prior year. It was composed of two questionnaires, a Questionnaire for Current Teachers who continued in the teaching profession from 1987-88 to 1988-89, and a Questionnaire for Former Teachers who had left the teaching profession at the end of the 1987-88 school year. The Questionnaire for Current Teachers was administered to a national sample of teachers drawn from the SASS sample of teachers. One stratum of this sample included teachers who had continued teaching in the same school (stayers), while another stratum included teachers who

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[4] A complete technical description of this survey is provided by Faupel, Bobbitt, and Friedrichs (1992), while a briefer, less-technical description is found in Boe and Gilford (1992, Appendix B). Copies of survey questionnaires are available from NCES.

Table 1

Description of the 1987-88 Schools and Staffing Survey (SASS) and the 1989 Teacher Followup Survey (TFS): Public Sector

Public Sector Questionnaire	Units Sampled	Sample Size
Schools and Staffing Survey (1987-88)		
1. Teacher Demand and Shortage	School Districts	5,398
2. Public School	Public Schools	9,060
3. School Administrator	School Principals	9,044
4. Public School Teacher	Public Teachers	46,928
Teacher Followup Survey (1989)		
1. Current Teachers (Continuing)	Public Teachers	
a. Same School (Stayers)	Public Teachers	2,120
b. Different School (Movers)	Public Teachers	1,221
2. Former Teachers (Leavers)	Public Teachers	1,693

Note. Data from the National Center for Education Statistics, USDE (Kaufman, 1991). Copies of the SASS and TFS questionnaires are available from NCES.

had moved to a different school (movers). The teacher sample was drawn within each stratum by using a probability proportionate-to-size selection procedure. In contrast, the Questionnaire for Former Teachers was administered to all teachers from SASS who had left the teaching profession at the end of the 1987-88 school year (leavers). The sample sizes for the followup questionnaires are also shown in Table 1.

TFS questionnaires were administered by mail, with extensive telephone followup. Consequently, questionnaire response rates were high--a weighted response rate of 97.5% for the Questionnaire for Current Teachers and 93.6% for the Questionnaire for Former Teachers (Faupel, et al., 1992, p. 4).

The followup questionnaires of public school teachers concentrated on their current employment and teaching status, educational activities and future plans, a wide variety of opinions about teaching, and demographic and socioeconomic characteristics. Since the TFS sample of teachers was drawn from the SASS sample, it is possible to link responses to SASS and TFS questionnaires, thereby permitting analysis of similarities and differences from one year to the next in many variables of interest, such as factors related to teachers transferring among schools and teachers leaving the profession.

Teacher Sample

In keeping with the SASS definition of a teacher and for the purposes of this research, a teacher was defined as:

> . . . any full-time or part-time teacher whose primary (i.e., main) assignment was teaching in any of grades K-12. Itinerant teachers were included, as well as long-term substitutes who were filling the role of a regular teacher on an indefinite basis. An itinerant teacher is defined as a teacher who teaches at more than one school (Kaufman, 1991, p. 5).

Thus, excluded from the definition of a teacher were individuals who identified their main assignment as a pre-kindergarten teacher, short-term substitute, student teacher, non-teaching specialist (e.g., counselor, librarian, school social worker, occupational therapist, and the like), administrator, teacher aide, and other professional or support staff. The application of this definition of a teacher was accomplished by a two-stage process. First, schools selected for the SASS sample were asked to provide teacher lists for their schools from which the teacher sample for the school was selected. The individuals thus selected were sent the teacher questionnaire, the first item of which asked them to identify their main assignment at that school. Those that indicated their main assignment was other than a regular, itinerant, or long-term substitute teacher (either full-time or part-time) were not included in the teacher sample. Thus, at the second stage, teachers self-defined their main assignment and, therefore, their status as a teacher.

SETs were defined operationally as those public school teachers in 1987-88 who selected any one of five special education specializations in response to item 16a of the SASS teacher questionnaire which read as follows: "What is your current primary teaching assignment field at THIS SCHOOL, that is, the field in which you teach the most classes?" The five special education specializations from which the teachers selected were: learning disabled, mentally retarded, emotionally disturbed, speech and hearing impaired, and other special education. In view of the category "other special education," all elementary and secondary teachers with a main assignment in the broad field of special education should have been able to identify themselves as such, regardless of the particular certification categories or terminology used in their home state. For the analyses based on the two subcategories of SETs, the first was composed of teachers that identified their main teaching assignment as learning disabled, while the other was composed of all teachers that identified their main teaching assignment as any one of the other four specializations listed above. Small sample sizes did not permit further subdivision of this second subgroup of SETs into other specializations.

GETs were defined operationally as public school teachers in 1987-88 who selected any one of 26 other teaching specializations in elementary and secondary education in response to item 16a of the SASS teacher questionnaire. Vocational education was included in these 26 specializations, while the pre-kindergarten specialization was excluded.

The sizes of the samples of teachers on which the analyses of this report were based are presented Tables 2 through 11. The total sample size of 4,798 teachers reported in Table 2 is the net teacher followup sample after modest questionnaire nonresponse.

Design

The research was designed to analyze, from a national perspective, four components of the public education teacher force; namely, school retention, reassignment, migration, and attrition of special education and general education teachers from school year 1987-88 to 1988-89, as described below.

School Retention. Public school teachers in 1987-88 who continued as public school teachers in the same school in 1988-89 constituted the school retention component. Such teachers (called stayers) were defined operationally as public school teachers in 1987-88 who selected response alternative 1 to item 9 of the TFS Questionnaire for Current teachers.

Reassignment. Public school teachers in 1987-88 who were reassigned, either voluntarily or involuntarily, to a different school in the same district in 1988-89 constituted the reassignment component. Such teachers (called reassignees) were defined operationally as public school teachers in 1987-88 who selected response alternative 1 to item 11 of the TFS Questionnaire for Current teachers.

Migration. Public school teachers in 1987-88 who migrated to a different public school district in 1988-89 constituted the migration component. Such teachers (called migrants) were defined operationally as public school teachers in 1987-88 who selected response alternative 2 to item 11 of the TFS Questionnaire for Current teachers. Migration was subdivided into teachers who migrated to a different school district within the same state and those who migrated to a school district in a different state. This discrimination was based on responses to two items: alternative (2) to item 11 and then item 10 of the Questionnaire for Current Teachers.

Attrition. Public school teachers in 1987-88 who left public school teaching in 1988-89 (called leavers) constituted the attrition component. This included public school teachers (K through 12) in 1987-88 who left to teach pre-kindergarten and to teach in a private school in 1988-89. Such teachers (called leavers) were defined operationally as all public school teachers in 1987-88 who either (a) completed the TFS Questionnaire for Former Teachers, (b) selected alternative 5 to item 11 of the TFS Questionnaire for Current Teachers (i.e., moved from a public to a private school), or (c) classified their main teaching assignment as pre-kindergarten teaching in response to item 5a of the TFS Questionnaire for Current Teachers.

Attrition was investigated in terms of (a) reasons given by leavers for exiting the teaching profession, (b) occupational status of leavers in the year after leaving public school teaching, and (c) plans of leavers to return to teaching--all based on the Questionnaire for Former Teachers. The first analysis was based on responses to item 23a. which read: "What was your main reason for leaving the teaching profession?". The five main reasons analyzed were (a) to pursue another career, (b) for pregnancy and/or child rearing, (c) for family considerations or personal move, (d) to retire, and (e) other, which included health reasons, for better salary or benefits, to take course to improve career opportunities (either in or out of education), school staffing action (lay-offs, school closing, etc.), to take a sabbatical, dissatisfied with teaching as a career, and other family or personal reason.

The second analysis was based on responses to item 1 which read: "What is your primary occupational status?" The five occupational status categories analyzed were (a) employment in an elementary or secondary school other than teaching, (b) employment in an occupation outside of elementary or secondary education, (c) homemaking and/or child rearing, (d) retired, and (e) attending a college or university, disabled, and other.

The third analysis was based on responses to items 18 ("Do you plan to return to teaching?") and 19 ("How soon might you return to teaching?"). The four categories of plans analyzed were (a) by next year, which included response alternatives 1 (later this school year) and 2 (next year) to item 19, (b) eventually, which included response alternatives 3 (within five years) and 5 (more than five years from now) to item 19, (c) undecided, based on response alternative 5 to item 19, and (d) never, based on response alternative 2 to item 18.

A subsidiary analysis was made of former public school teachers (i.e., leavers) who became employed in other education positions. They were analyzed in terms of their responses to item 2 which read: "What is your main school assignment?" The four categories of other education positions included (a) school administrator, (b) nonteaching specialist (counselor, librarian, etc.) and resource person for teachers (department head, curriculum coordinator, etc.), (c) other, which included support staff, coach, and other, and (d) private school teaching in 1988-89 (defined by response alternative 5 to item 11 of the Questionnaire for Current Teachers).

Another subsidiary analysis was made of former public school teachers (i.e., leavers) who became employed in an occupation outside of elementary or secondary education. They were analyzed in terms of their responses to item 3a. which read: "What kind of business or industry is this?" Responses to this item were first coded in accordance with the Industry and Occupation Codes of the U.S. Bureau of Census, and then classified by the authors into (a) educationally-relevant positions, such as speech and hearing specialist, and (b) not educationally-relevant position (i.e., all positions not included in educationally-relevant).

To recapitulate, the principal part of the research design was a 2 x 4 design based on two main teaching fields (special and general education) and four categories of teachers in 1988-89 (retention, reassignment, migration, and attrition), along with various subdivisions of migrant and leaving teachers.

The research also analyzed turnover of two subcategories of SETs included in the principal part of the design. These two subcategories were (a) teachers specializing in teaching students with learning disabilities (LDTs) and (b) all other SETs. This phase also investigated the four basic categories of teacher status in 1988-89 (i.e., retention, reassignment, migration, and attrition). In addition, the subcategory of SETs migrating to different districts was investigated further in terms of in-state and out-of-state migration. Finally, those who had left the profession in 1988-89 were further subdivided by four levels of plans to return to teaching.

Analysis Procedures

Based on the teacher followup sample sizes reported in Tables 2 through 11, weighted estimates of the numbers of teachers nationally were computed by procedures used by NCES for complex sample survey data (Faupel, et al., 1992). These national estimates are presented in this paper and were used for statistical analyses. Because SASS and TFS data are subject to design effects due to stratification and clustering of the sample, standard errors were computed using the method of balanced repeated replications. Finally, chi-square tests of the statistical significance of differences between SETs and GETs were performed on the nationally estimated numbers of teachers, and were adjusted appropriately for average weights and for average design effects due to the structure of the sampling procedure. Also computed were *t*-tests of the significance of differences between SET and GET percentages.

Results

Comparisons of Special and General Education Teachers

National estimates of the total numbers of SETs (245,292) and GETs (2,135,731) in the public school teaching force in 1987-88, as well as the status of these teachers in 1988-89, are presented in Table 2.[5] As seen, school retention from 1987-88 formed the predominant component of the teaching force in 1988-89, though considerably less so for special education (79.9%) than for general education (87.1%) teachers. Therefore, more SETs (20.1%) than

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[5] All tables of results (tables numbered 2 through 11) are presented at the end of this report following the list of references.

GETs (12.9%) necessarily left their public school assignment in 1987-88. Special and general education differed significantly in the percentages of teachers in the various turnover categories, $\chi^2(3, N = 4{,}798) = 21.42, p < .01$. The SET/GET differences are considerable, and indicate that SETs are more mobile within public education and leave teaching at a higher rate than GETs.

A central issue for this research was the comparison of attrition of SETs and GETs, as shown in Table 2. On the basis of limited, but rather consistent past research, it was hypothesized that SETs leave teaching at a higher rate than GETs. As expected, the SET attrition percentage (7.9%) was significantly higher than for GETs (5.7%), $t(1{,}610) = 1.68$, $p < .05$ one-sided.

More detailed data on the mobility of GETs and SETs within public education is presented in Table 3 with respect to migration in-state and out-of-state. Special and general education differed significantly in the percentages of teachers in the various school transfer categories, $\chi^2(3, N = 3{,}164) = 26.83, p < .01$. Of the teaching force continuing from 1987-88 to 1988-89, the data show that teachers transferring to out-of-state public schools are a very small proportion of the entire teaching force (1.3%). Once again the significantly greater mobility of SETs than GETs within public education is seen, both within [$t(416) = 3.27$, $p < .01$ two-sided] and across [$t(162) = 2.22$, $p < .05$ two-sided] state boundaries.

Table 3 also shows that the estimated total number of teachers transferring to a public school in a different state was 20,329. To analyze further the mobility of these teachers, they were subdivided into those who transferred to an adjacent state (i.e., one with a common border with the home state) and those who transferred to a nonadjacent state (i.e., one not having a common border with the home state). This subanalysis showed that significantly more teachers transferred to a nonadjacent state (63.8%) than to an adjacent state (36.2%), $t(162) = 1.98$, $p < .05$ two-sided.

The main reasons given for leaving teaching are reported in Table 4. Special and general education differed significantly in the percentages of exiting teachers reporting various reasons for leaving, $\chi^2(3, N = 1{,}543) = 15.90, p < .01$. The striking differences between SETs and GETs are that a the higher percentage of SETs leave to pursue another career (30.4% versus 10.8%), while a much higher percentage of GETs leave to retire (24.9% versus 6.1%).

The main reasons given for leaving teaching in 1987-88, as reported in Table 4, do not correspond exactly to the primary activity actually assumed in the following year (see Table 5). Whereas 30.4% of SETs and 10.8% of GETs reported leaving teaching mainly to pursue another career, the percentage of leavers actually employed in 1988-89 was much higher (47.4% for SETs and 38.1% for GETs for employment in and out of education combined). The data in Table 5 suggest that SETs are more likely than GETs to be employed in non-teaching positions in education (32.1% versus 21.2%), while GETs are more likely than SETs to be retired (24.1%% versus 17.2%). However, special and general education did not differ significantly in the percentages of the post-teaching activity reported by teachers who left, $\chi^2(4, \underline{N} = 1{,}612) = 3.47, \underline{p} > .10$.

Comparing Tables 4 and 5, we note that while 19% of all teachers reported pregnancy and child rearing as the main reason for leaving, in the year after leaving fully 25% were principally engaged in homemaking and child care. SETs were three times more likely than GETs to report pursuit of another career as the main reason for leaving, while GETs were four times more likely than SETs to report that retirement was the main reason (see Table 4). While these differences between SETs and GETs in reasons for leaving were statistically significant, SETs and GETs did not differ significantly in their actual activities during the year following leaving (see Table 5). For teachers as a whole, the three most prevalent principal activities during the year after leaving were employment (40%), homemaking/child care (25%), and retirement (23%).

Results of an analysis of leavers who took non-teaching positions in public elementary and secondary schools are reported in Table 6. The data suggest that more SETs than GETs go into school administration (37.2% versus 22.5%), while more GETs than SETs take supervisory and specialist positions (35.6% versus 17.6%). However, the small sample sizes resulted in large standard errors of these percentages, and special and general education did not differ significantly in the percentages of teachers taking various non-teaching positions in public elementary and secondary schools, $\chi^2(3, \underline{N} = 300) = 1.75, \underline{p} > .10$.

Although, based on the data in Table 5, the percentages of SET and GET leavers who took employment in positions outside of elementary or secondary education was similar (15.3% versus 16.9%), it is possible that teachers in one of these fields are more likely to enter occupations relevant to education. The results of an analysis exploring this possibility are shown in Table 7. While it appears that SETs were more inclined than GETs to take such employment (33.8% versus 18.8%), the difference was not statistically significant at the .05 level, though it was significant at the .10 level, $\chi^2(1, N = 362) = 2.72, p < .10$.

The final analysis of SET and GET leavers addressed their stated plans to return to teaching. For this analysis, retired teachers and those who had advanced to administrative positions in schools were excluded because very few, if any, would be expected to return. As shown in Table 8, 26.7% of total leavers reported they planned to return to teaching within one year, while another 45.3% stated they might return at some future time. These data are important because they provide information about the potential size of a major component of the reserve pool of teachers (i.e., experienced teachers who might return to teaching). In all, almost three-fourths of these leavers might return to teaching sometime. However, special and general education did not differ significantly in the plans of leavers to return to teaching, $\chi^2(3, N = 1{,}133) = 1.18, p > .10$. As also shown in Table 8, SETs and GETs differed little in their respective percentages of leavers who never intend to return to teaching.

Comparisons of LDTs and Other SETs

The status of 1987-88 teachers in 1988-89 is presented separately for LDTs and for other SETs in Table 9. As also seen in Table 2, the data in Table 9 reveal that school retention from 1987-88 accounts for the predominant component of the teaching force in 1988-89, though somewhat less so for other SETs (77.3%) than for LDTs (82.7%). Learning disabled and other special education specializations differed significantly in the percentages of teachers in the various turnover categories, $\chi^2(3, N = 639) = 9.58, p < .05$. In addition, the attrition percentage reported in Table 9 for LDTs (5.0%) was less than half that of other SETs (10.6%), a difference that was statistically significant, $t(186) = 2.22$, $p < .05$ two-sided.

As shown in Table 9, LDTs tend to be retained in their school at a higher rate than other SETs. In this respect, LDTs are more like GETs. A comparison of the column percentages for LDTs in Table 9 with the column percentages for GETs in Table 2 suggests that LDTs are less likely to be retained than GETs. Teachers in the learning disabled specialization differed significantly from those in general education in the percentages of teachers classified in the various turnover categories [$\chi^2(3, N = 4{,}443) = 17.81, p < .01$], though the specific attrition percentages of LDTs (5.0%) and GETs (5.7%) were equivalent. All these comparisons indicate that, with respect to school retention and turnover, LDTs turn over at a higher rate than GETs but at a lower rate than other SETs.

Table 10 presents results from a more detailed analysis of the mobility of LDTs and other SETs within public education. The overall observed differences in school retention and transfer percentages between the two groups were modest and not statistically significant, $\chi^2(3, N = 451) = 5.69$, $p > .10$.

Finally, LDTs and other SETs were compared in terms of their plans to return to teaching. Again, for this purpose, retired teachers and those who had advanced to school administrative positions were excluded because very few, if any, would be expected to return. Though sizable differences were observed, the small sample sizes resulted in large standard errors of these percentages. Consequently, the learning disabled and other special education specializations did not differ significantly in the plans of leavers to return to teaching, $\chi^2(3, N = 148) = 2.23$, $p > .10$.

Discussion

The results demonstrate that, in accordance with a model of teacher retention and turnover at the school level, it is possible to distinguish among and to quantify the several components of teacher turnover by using data from national surveys (SASS and TFS). These analyses also illustrate the considerable complexity of the teacher turnover phenomenon, and the need to be precise in drawing conclusions about the magnitude of what is often simply termed "teacher attrition." Whether attrition percentages are relatively low or high depends, in large part, on the components of teacher turnover that are included in computing these percentages. We recommend that the components of teacher turnover be analyzed and reported separately, and that teacher attrition percentages be defined precisely as exit attrition. The meaningful comparison of research findings on teacher turnover and our collective understanding of this phenomenon could be enhanced greatly by the adoption of standard concepts, such as those suggested here.

Teacher turnover is the most generic term for changes in teacher status from one year to the next, and can be viewed from the perspectives of a public school, a school district, a state, and the nation as a whole. For example, teacher turnover from the school perspective has implications for staffing classrooms; from the district perspective has implications for recruiting, hiring, and assigning teachers to schools; from the state perspective has implications for insuring that an adequate supply of qualified teachers is available for hiring by districts; and from the federal perspective has implications for monitoring the size, composition, and distribution of the national teaching force and for forming public policy contributing to the production and maintenance of an adequate supply of qualified teachers. The results presented here addressed teacher turnover at the school level, but aggregated for the nation as a whole, and addressed teacher turnover at the district by subdividing teacher transfers into components of within-district reassignment and cross-district migration, also aggregated for the nation as a whole. Similarly, teacher turnover at the state level was addressed by discriminating between within-state migration among districts and out-of-state migration, likewise aggregated for the nation as a whole. Finally, teacher turnover at the national level was represented simply by exit attrition.

Provided adequate data bases are available, similar analyses of teacher turnover could be made for particular schools, districts, and states. Since TFS was not designed to provide state level estimates, it would not be possible to use SASS and TFS data for this purpose. The most feasible alternative method for studying teacher supply, retention, and turnover at the level of a particular state is to develop a teacher data base from state administrative records. In addition to making such analyses possible, state level teacher data bases have several other advantages such as providing for longitudinal analyses of the state teaching force (Boe & Gilford, 1992).

Viewed from the school level, teacher turnover is considerably higher in special education than in general education, with school transfer (reassignment and migration) accounting for more turnover than exit attrition for both groups of teachers. From the district perspective, however, roughly half the number of total teachers transferring to a different school do so within the district (i.e., reassignment), therefore not requiring the hiring of teachers to replace them. Nonetheless, exit attrition is the largest component of turnover at the district and state levels, and does require that leavers be replaced. As other research has consistently suggested, the attrition percentages reported here confirm that SETs leave public school teaching at a significantly higher annual rate than GETs (7.9% versus 5.7%). There is no ambiguity about the meaning of teacher attrition from these data because all cross school, district, and state transfers are accounted for, as well as transfers to private school teaching.

While the data reported here have quantified all the components of teacher turnover at the public school level from 1987-88 to 1988-89 for both the special and general education fields, there is one other important component of teacher transfer that has not been analyzed; namely the cross-transfer of practicing SETs in 1987-88 to general education in 1988-89, and vice versa. While it is widely recognized that many such transfers occur annually, there are no national data on this phenomenon and the best state data available indicated that 5% of SETs transferred to general education following the 1986-87 school year in the State of Washington (Schrag & Theobald, 1989). In that study, data were not reported on transfers of GETs to special education. Though we attempted to analyze cross-field transfers with the SASS and TFS data, it was our judgement that the sample size was too small to yield a credible estimate of the magnitude of this phenomenon. Determining the extent and character of cross-field transfers of teachers is a prime topic for further research.

While many teachers leave teaching in any one year, a considerable portion of these are not permanently lost to the profession. With respect to the plans of leavers to return to teaching, 20% reported an intent to return within a year and another 12% reported an intent to return eventually. While information on "plans to return," is not expected to agree exactly with the rate with which leavers actually return, nonetheless the information on plans quite likely represents reasonable estimates of the rate and magnitude with which these leavers did actually return for the 1989-90 school year and later. For instance, the actual return percentages within five years of leaving for Michigan and North Carolina SETs were 34% and 26%, respectively (Singer, 1993). As reported by various researchers (e.g., Boe et al., 1993; Kirby, Grissmer, & Hudson, 1991; Singer, 1993), the return of experienced teachers constitutes a major source of teacher supply.

Even though many teachers leave teaching, a considerable portion remain in non-teaching positions in education. As seen, about a quarter of leavers were employed in education during the year following leaving, and over half of these advanced to school administration and specialist/supervisory positions. Another 15% of public school leavers transferred to private school teaching. Even 20% of leavers taking employment out of education were working in educationally-related positions. Though the higher percentage of SET than GET leavers who took employment in educationally-related positions was not statistically significant, it is reasonable to hypothesize that such a difference is genuine, and further research might be conducted explore this possible relationship further.

Several other differences between SET and GET percentages, although not statistically significant in the data reported here, are plausible and worthy of further research. For example, SET leavers who take employment in schools are more likely than GETs to assume administrative positions, while GETs are more likely to assume specialist or supervisory positions. Also, SET leavers are less likely to return to teaching within one year of leaving than are GETs.

Though teacher turnover obviously is a problem for education administrators and policy makers in staffing the nation's classrooms, much turnover is acceptable or even desirable (e.g., moving to a new school or to a leadership position) and much is inevitable (e.g., retirement). From a state and national perspectives, the most troublesome component of turnover is exit attrition because it represents a reduction in the teaching force. Since exit attrition is significantly higher for SETs than GETs, this problem is accentuated for administrators and policy makers in special education, who, understandably, might consider investing more resources in efforts to improve retention. In light of the results of this research, we can make estimates of how fruitful such intervention might be in stabilizing the teaching force in special education.

Of the some 19,500 SETs who left public school teaching following the 1987-88 school year, presumably little would be gained by trying to retain those who (a) were unqualified (about 3,000 teachers[6]) unless upgrading their qualifications, (b) advanced to administrative and specialized positions in education (about 3,500), and (c) retired, became disabled, or were lost due to job actions (about 4,000). These three components account for 10,500 of the 19,500 SET leavers, with the difference of 9,000 SET leavers nationally constituting the potential targets for retention initiatives. However, of these 9,000 SET leavers, there is good reason to believe that some 2,500 will stop out for only one year, not too serious a loss since one can expect an equivalent annual outflow of SETs leaving for one year and inflow of returning SETs from the prior year. This is a form of turnover that might well be either constructive (e.g., upgrading skills, recovering from burnout, etc.) or unavoidable (e.g., spousal move, pregnancy, care for small children, etc.). If leavers for one year are removed from the net of 9,000 leavers that might be targeted for retention initiatives, a net of 6,500 potential SET stayers remain who are distributed across the 50 states.

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[6] Data from both OSEP (1992) and Boe, Cook, Kaufman, and Danielson (unpublished tables from the 1987-88 SASS) indicate that about 10% of practicing SETs are not fully certified in their main teaching assignment. However, Boe, Bobbitt, Cook, and Whitener (1993) data indicate that the attrition rate for SETs who are not fully-certified in their main teaching assignment is much higher than for fully-certified SETS (16% versus 7%, unpublished tables from 1989 TFS). Therefore, of the 19,500 SETs who left teaching at the end of the 1987-88 school year, a disproportionate number (approximately 3,000) were less than fully-certified SETs.

Another way to estimate the potential for improving the retention of teachers in special education is to compute the number of additional SETs that could be retained annually if it were possible to reduce the exit attrition percentage of SETs to that of GETs. Based on the data presented here, a reduction of SET annual attrition from 7.9% to 5.7% would reduce SET attrition by some 5,500 teachers, also distributed across the 50 states.

Since both methods for estimating the numbers of additional SETs that potentially might be retained by effective intervention are rough approximations, the average of the two methods (i.e., 6,000 potential additional SET retainees per year) might be used to examine the prospective benefits of fully-effective teacher retention initiatives. At 100% effectiveness, the prospects of satisfying the need for 30,000 additional fully-certified SETs (OSEP, 1992) could be achieved in five years--not an unreasonable length of time considering the years required to educate a beginning teacher. However, if additional retention initiatives were only 50% effective (a more reasonable assumption than 100% effectiveness), then the incremental annual yield of retainees would be only 3,000. In that event, policy makers would almost certainly wish to increase the yield from various sources of supply, such as teacher education programs and recruitment from the reserve pool.

These analyses of the potential for improving retention of SETs suggest to us that there is much to be gained by strategies that address both retention and supply. Such strategies make teaching in special education more appealing generally, thereby enhancing both retention of active teachers and the attractiveness of special education to potentially entering teachers. Strategies that might be taken are (a) improving further the qualifications of SETs through professional development so that teaching is less stressful,[7] (b) designing policies by which it is relatively easy for teachers to move between special and general education teaching (thereby giving SETs a temporary break from the added stress of teaching children with disabilities), (c) increasing resources and support for teaching handicapped children, and, of course, (d) providing a salary differential for teaching in special education. Before one or more of these strategies are taken, however, each should be subjected to both a cost-benefit analysis and a "feasibility" analysis in relation to supply-side strategies designed to enhance the yield of entering teachers from teacher education programs, from the reserve pool, and from active GETs who are also qualified to teach in special education.

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[7] Since the SASS and TFS data from 1987-89 reported here were collected, efforts to enhance the professional development of SETs through the Comprehensive System for Personnel Development in Special Education have been considerably intensified.

As shown here, the subsetting of total SETs into those who teach students with learning disabilities and other SETs demonstrated patterns of retention and turnover that were significantly different, with LDTs being more stable in their positions. Based on comparisons of LDTs with other SETs and with GETs, the results indicated that, with respect to school retention and turnover, LDTs tend to turn over at a lower rate than other SETs but at a higher rate than GETs. This finding is reasonable because teaching students with learning disabilities requires much of the same knowledge and many of the same skills as teaching students who do not have disabilities. Hence, LDTs have more in common with GETs than do other SETs. Other differences between LDTs and GETs examined were not statistically significant. However, the data suggest LDT leavers are more inclined to return to teaching than are other SETs. Further research should be conducted to test this possibility.

The data on teacher attrition presented in this paper are relevant to assessing the annual demand for replacement teachers. In addition, annual growth in the number of teaching positions creates demand for additional teachers. However, neither source of annual demand necessarily creates teacher shortages as measured by unfilled teaching positions. In fact, national SASS data from 1987-88 and 1990-91 indicate that only about one-half percent of funded teaching positions were unfilled (Choy, Henke, Alt, Medrich, & Bobbitt, 1993). Another definition of teacher shortage is the number of teaching positions filled by less than fully-qualified teachers. In special education, shortage of this type has been quantified as the number of teachers "needed" in annual reports to Congress by the Office of Special Education Programs (OSEP) (e.g., 1992). For 19884-85, OSEP (1987) reported a national shortage of 23,000 fully-qualified SETs (or 8.3% total SET demand). Six years later in 1989-90, the shortage of fully-qualified SETs had increased 26% to approximately 29,100 (or 9.6% of total SET demand) (OSEP, 1992). From all these data, it is clear that SET attrition does not contribute to teacher shortage as measured by unfilled positions; instead SET attrition contributes to the shortage of fully-qualified teachers by working against efforts being made in the field of special education to staff all teaching positions with fully-qualified personnel. Annual attrition of qualified SETs has thus served to exacerbate the shortage problem.

The main objectives of this research have been to provide, from a national perspective, quantitative data on each component of teacher retention and turnover at the school level, and to identify similarities and differences between SETs and GETs in these respects. Though this has been accomplished, we have not addressed here the many variables pertaining to teacher characteristics, working conditions, and school/community attributes that are related to retention and turnover of SETs. Available literature on these considerations has been reviewed by Billingsley (1993) and Brownell and Smith (1992). Based on research in progress with SASS and TFS data, subsequent papers of ours will contain much new information about variables related to teacher retention and turnover for both SETs and GETs.

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Table 2

National Estimates of Public School Teacher Retention, Reassignment, Migration, and Exit Attrition as a Function of Main Teaching Field: 1987-88 to 1988-89

		Main Teaching Field: 1987-88*		
Teacher Status: 1988-89	Statistic[a]	Special Education	General Education	Total
Retention in the Same School from 1987-88	Nat. Est.	196,057	1,860,513	2,056,570
	Col %	79.9%	87.1%	86.4%
	SE %	1.9%	0.5%	0.5%
	n	241	1,824	2,065
Reassignment to a Different School in the Same District for 1988-89	Nat. Est.	13,219	86,619	99,839
	Col %	5.4%	4.0%	4.2%
	SE %	0.7%	0.3%	0.2%
	n	92	425	517
Migration to a Different School in a Different District for 1988-89	Nat. Est.	16,540	65,826	82,366
	Col %	6.7%	3.1%	3.5%
	SE %	0.9%	0.3%	0.3%
	n	118	486	604
Attrition from Public School Teaching for 1988-89	Nat. Est.	19,475	122,773	142,248
	Col %	7.9%	5.7%	6.0%
	SE %	1.3%	0.4%	0.3%
	n	188	1,424	1,612
Total Teaching Force in 1987-88	Nat. Est.	245,292	2,135,731	2,381,022
	SE Est.	18,789	51,387	58,453
	Col %	100.0%	100.0%	100.0%
	n	639	4,159	4,798

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of columns or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size.

*The χ^2 for this 4 x 2 table was 21.42 ($p<.01$).

Table 3

National Estimates of Continuing Public School Teachers as a Function of School Transfer Location and Main Teaching Field: 1987-88 to 1988-89

		Main Teaching Field: 1987-88*		
1988-89 School Transfer Location	Statistic[a]	Special Education	General Education	Total
Same School	Nat. Est.	196,057	1,860,513	2,056,570
	Col %	86.8%	92.8%	91.8%
	SE%	1.4%	0.4%	0.5%
	n	241	1,824	2,065
Different School/Same District	Nat. Est.	13,219	86,619	99,839
	Col %	5.9%	4.3%	4.5%
	SE%	0.8%	0.3%	0.3%
	n	92	425	517
Different District/Same State	Nat. Est.	10,830	41,604	52,434
	Col %	4.8%	2.1%	2.5%
	SE%	0.8%	0.2%	0.2%
	n	71	347	418
Out-of-State District	Nat. Est.	5,657	14,672	20,329
	Col %	2.5%	0.7%	1.3%
	SE%	0.6%	0.1%	0.2%
	n	44	120	164
Total ContinuingTeachers: 1987-88 to 88-89	Nat. Est.	225,763	2,003,408	2,229,172
	SE Est.	18,323	50,339	57,545
	Col %	100.0%	100.0%	100.0%
	n	448	2,716	3,164

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of columns or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size. Item nonresponse resulted in a sample size reduction of 22 teachers.

*The χ^2 for this 4 x 2 table was 26.83 ($p < .01$).

Table 4

National Estimates of Exiting Public School Teachers as a Function of Reason for Leaving and Main Teaching Field: 1987-88 to 1988-89

		Main Teaching Field: 1987-88*		
Main Reason for Leaving Teaching After 1987-88	Statistic[a]	Special Education	General Education	Total
Pursue other Career	Nat. Est.	_[b]	12,433	17,688
	Col %	30.4%	10.8%	13.4%
	SE %	11.0%	2.0%	2.4%
	n	19	112	131
Pregnancy/Child Rearing	Nat. Est.	3,016	22,045	25,062
	Col %	17.4%	19.2%	19.0%
	SE %	4.7%	3.3%	2.9%
	n	40	172	212
Family or Personal Move	Nat. Est.	_[b]	10,483	11,521
	Col %	6.0%	9.1%	8.7%
	SE %	2.1%	1.6%	1.5%
	n	19	130	149
Retirement	Nat. Est.	_[b]	28,619	29,669
	Col %	6.1%	24.9%	22.5%
	SE %	2.2%	3.0%	2.4%
	n	19	346	365
Other[c]	Nat. Est.	6,949	41,273	48,223
	Col %	40.1%	35.9%	36.5%
	SE %	8.3%	2.6%	2.4%
	n	76	610	686
Total Exit Attrition from 1987-88	Nat. Est.	17,309	114,853	132,162
	SE Est.	2,872	6,980	6,990
	Col %	100.0%	100.0%	100.0%
	n	173	1,370	1,543

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of colums or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size. Item nonresponse resulted in a sample size reduction of 69 teachers.

[b] Sample too small (<30) for computing a reliable estimate.

[c] Other includes health, better salary, to return to school, dissatisfied with teaching, lay-offs, to take sabatical, and other.

*The χ^2 for this 5 x 2 table was 15.90 ($p < .01$).

Table 5

National Estimates of Exiting Public School Teachers as a Function of Post-Teaching Activity and Main Teaching Field: 1987-88 to 1988-89

		Main Teaching Field: 1987-88*		
Post-Teaching Activity	Statistic[a]	Special Education	General Education	Total
Employment: In Education	Nat. Est.	6,246	26,005	32,251
	Col %	32.1%	21.2%	22.7%
	SE %	8.1%	3.5%	3.3%
	n	47	255	302
Employment: Out of Education	Nat. Est.	2,982	20,741	23,724
	Col %	15.3%	16.9%	16.7%
	SE %	4.1%	1.7%	1.6%
	n	39	323	362
Homemaking/Child Care	Nat. Est.	5,451	30,698	36,149
	Col %	28.0%	25.0%	25.4%
	SE %	7.0%	3.7%	3.4%
	n	55	267	322
Retirement	Nat. Est.	—[b]	29,546	32,894
	Col %	17.2%	24.1%	23.1%
	SE %	6.6%	2.4%	2.1%
	n	25	356	381
Other[c]	Nat. Est.	—[b]	15,783	17,230
	Col %	7.4%	12.9%	12.1%
	SE %	3.0%	1.7%	1.5%
	n	22	223	245
Total Exit Attrition from 1987-88	Nat. Est.	19,475	122,773	142,248
	SE Est.	3,175	7,556	7,605
	Col %	100.0%	100.0%	100.0%
	n	188	1,424	1,612

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of colums or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size.

[b] Sample too small (< 30) for computing a reliable estimate.

[c] Other includes to return to school, disabled and other.

*The χ^2 for this 5 x 2 table was 3.47 ($p > .10$).

Table 6

National Estimates of Exiting Public School Teachers who Secured Employment in Education as a Function of Type of Position and Main Teaching Field: 1987-88 to 1988-89

		Main Teaching Field: 1987-88*		
Type of Employment in Education in 1988-89	Statistic[a]	Special Education	General Education	Total
Administration	Nat. Est.	_[b]	5,810	8,133
	Col %	37.2%	22.5%	25.3%
	SE %	21.2%	4.7%	6.1%
	n	12	87	99
Specialist and Supervisory	Nat. Est.	_[b]	9,191	10,290
	Col %	17.6%	35.6%	32.1%
	SE %	12.8%	9.0%	7.6%
	n	14	69	83
Private School Teaching	Nat. Est.	_[b]	3,464	4,905
	Col %	23.1%	13.4%	15.3%
	SE %	13.2%	4.1%	3.9%
	n	9	39	48
Other[c]	Nat. Est.	_[b]	7,381	8,764
	Col %	22.1%	28.6%	27.3%
	SE %	15.0%	11.0%	9.6%
	n	12	58	70
Total	Nat. Est.	6,246	25,846	32,092
	SE Est.	2,161	5,090	5,438
	Col %	100.0%	100.0%	100.0%
	n	47	253	300

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of columns or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size. Item nonresponse resulted in a reduction of sample size of two teachers.

[b] Sample too small (<30) for computing a reliable estimate.

[c] Other includes employment such as support staff, coach and other.

*The χ^2 for this 4 x 2 table was 1.75 ($p > .10$).

Table 7

National Estimates of Exiting Public School Teachers Who Secured Employment in Positions Outside Education as a Function of the Educational Relevance of the Position and Main Teaching Field: 1987-88 to 1988-89

		Main Teaching Field: 1987-88*		
Educational Relevance of Position	Statistic[a]	Special Education	General Education	Total
Educationally-Relevant Position	Nat. Est.	—[b]	3,897	4,905
	Col %	33.8%	18.8%	20.7%
	SE %	11.6%	2.9%	3.0%
	n	14	68	82
Not Educationally-Relevant Position	Nat. Est.	—[b]	16,845	18,819
	Col %	66.2%	81.2%	79.3%
	SE %	11.6%	2.9%	3.0%
	n	25	255	280
Total Employed Outside Education	Nat. Est.	2,982	20,741	23,724
	SE Est.	675	1,915	2,084
	Col %	100.0%	100.0%	100.0%
	n	39	323	362

Note. Data from the 1987-88 Schools and Staffing Survey and the1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of colums or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size.

[b] Sample too small (<30) for computing a reliable estimate.

*The χ^2 for this 2 x 2 table was 2.72 ($p < .10$).

Table 8

National Estimates of Exiting Public School Teachers as a Function of Their Plans to Return to Teaching and Main Teaching Field: 1987-88 to 1988-89

		Main Teaching Field: 1987-88*		
Plans to Return to Teaching	Statistic[a]	Special Education	General Education	Total
By Next Year	Nat. Est.	2,697	24,247	26,944
	Col %	18.5%	28.1%	26.7%
	SE%	5.7%	3.7%	3.4%
	n	39	254	293
Eventually	Nat. Est.	2,493	12,837	15,330
	Col %	17.1%	14.9%	15.2%
	SE%	4.8%	2.2%	2.1%
	n	34	156	190
Undecided	Nat. Est.	5,103	25,271	30,374
	Col %	35.1%	29.3%	30.1%
	SE%	10.1%	3.9%	3.6%
	n	48	300	348
Never[c]	Nat. Est.	—[b]	24,036	28,298
	Col %	29.3%	27.8%	28.0%
	SE%	12.5%	3.0%	3.1%
	n	27	275	302
Total Exit Attrition from 1987-88	Nat. Est.	14,555	86,390	100,945
	SE Est.	2997	7104	7074
	Col %	100.0%	100.0%	100.0%
	n	148	985	1133

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of columns or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size. Item nonresponse resulted in the loss of 83 teachers.

[b] Sample size too small (<30) to compute a reliable estimate.

[c] Excludes teachers who retired and who advanced to administrative positions in education.

*The χ^2 for this 4 x 2 table is 1.18 ($p > .10$).

Table 9

National Estimates of Public Special Education Teacher Retention, Reassignment, Migration, and Exit Attrition as a Function of Specialization: 1987-88 to 1988-89

		Specialization: 1987-88*		
Teacher Status: 1988-89	Statistic[a]	Learning Disabled	Other Spec. Ed.	Total Spec. Ed.
Retention in the Same School from 1987-88	Nat. Est.	97,637	98,420	196,057
	Col %	82.7%	77.3%	79.9%
	SE %	1.9%	3.1%	1.9%
	n	108	133	241
Reassignment to a Different School in a the Same District for 1988-89	Nat. Est.	4,650	8,570	13,219
	Col %	3.9%	6.7%	5.4%
	SE %	0.8%	1.3%	0.7%
	n	35	57	92
Migration to a Different School in a Different District for 1988-89	Nat. Est.	9,817	6,723	16,540
	Col %	8.3%	5.3%	6.7%
	SE %	1.3%	1.1%	0.9%
	n	63	55	118
Attrition from Public School Teaching for 1988-89	Nat. Est.	5,935	13,541	19,475
	Col %	5.0%	10.6%	7.9%
	SE %	0.8%	2.4%	1.3%
	n	78	110	188
Total Teaching Force in 1987-88	Nat. Est.	118,038	127,254	245,292
	SE Est.	12,050	11,668	18,789
	Col %	100.0%	100.0%	100.0%
	n	284	355	639

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of columns or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size.

*The χ^2 for this 4 x 2 table was 9.58 ($p < .05$).

Table 10

National Estimates of Continuing Public Special Education Teachers as a Function of School Transfer Location and Specialization: 1987-88 to1988-89

		Specialization: 1987-88*		
1988-89 School Transfer Location	Statistic[a]	Learning Disabled	Other Spec. Ed.	Total Spec. Ed.
Same School	Nat. Est.	97,637	98,420	196,057
	Col %	87.1%	86.6%	86.8%
	SE %	1.7%	2.1%	1.4%
	n	108	133	241
Different School/ Same District	Nat. Est.	4,650	8,570	13,219
	Col %	4.1%	7.5%	5.9%
	SE %	0.9%	1.5%	0.8%
	n	35	57	92
Different District/ Same State	Nat. Est.	5,659	5,224	10,883
	Col %	5.1%	4.6%	4.8%
	SE %	1.1%	1.1%	0.8%
	n	37	37	74
Out-of-State	Nat. Est.	_[b]	_[b]	5,657
	Col %	3.7%	1.3%	2.5%
	SE %	1.0%	0.5%	0.6%
	n	26	18	44
Total	Nat. Est.	112,103	113,713	225,816
	SE Est.	11,885	11,221	18,320
	Col %	100.0%	100.0%	100.0%
	n	206	245	451

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of columns or sums of rows may not equal totals because of rounding. Col = column; SE = standard error; n = sample size.

[b] Sample too small (<30) for computing a reliable estimate.

*The χ^2 for this 4 x 2 table was 5.69 ($p > .10$).

Table 11

National Estimates of Exiting Public Special Education Teachers as a Function of Their Plans to Return to Teaching and Specialization: 1987-88 to 1988-89.

		Specialization: 1987-88*		
Plans to Return to Teaching	Statistic[a]	Learning Disabled	Other Spec. Ed.	Total Spec. Ed.
By Next Year	Nat. Est.	—[b]	—[b]	2,697
	Col %	28.9%	14.0%	18.5%
	SE %	7.6%	7.1%	5.7%
	n	15	24	39
Eventually	Nat. Est.	—[b]	—[b]	2,493
	Col %	21.8%	15.1%	17.1%
	SE %	6.7%	6.4%	4.8%
	n	14	20	34
Undecided	Nat. Est.	—[b]	—[b]	5,103
	Col %	34.3%	35.4%	35.1%
	SE %	7.0%	14.5%	10.1%
	n	24	24	48
Never[c]	Nat. Est.	—[b]	—[b]	—[b]
	Col %	15.0%	35.5%	29.3%
	SE %	7.0%	17.2%	12.5%
	n	8	19	27
Total Exit Attrition from 1987-88	Nat. Est.	4437	10,118	14,555
	SE Est.	597	2929	2997
	Col %	100.0%	100.0%	100.0%
	n	61	87	148

Note. Data from the 1987-88 Schools and Staffing Survey and the 1988-89 Teacher Followup Survey, National Center for Education Statistics, USDE.

[a] Nationally weighted estimates (Nat. Est.) of the total numbers of full-time and part-time teachers combined at both the elementary and secondary levels in the public sector. Sums of columns or sums of rows may not equal totals because of rounding. Col = column; SE = standard error. n = sample size. Item nonresponse resulted in the loss of 13 teachers.

[b] Sample size too small (< 30) to compute a reliable estimate.

[c] Excludes teachers who retired and who advanced to administrative positions in education.

*The χ^2 for this 4 x 2 table was 2.23 ($p > .10$).

Appendix A

SASS TECHNICAL NOTES

For The Public School Teachers Questionnaire

Introduction

The data for this paper were collected on the Public School Teachers Questionnaire, one of seven questionnaires comprising the 1987-88 Schools and Staffing Survey (SASS), a survey developed by the U.S. Department of Education's National Center for Education Statistics (NCES), and conducted by the U.S. Bureau of the Census.

SASS was a mail survey which collected public and private sector data on the Nation's elementary and secondary teaching force, aspects of teacher supply and demand, teacher workplace conditions, characteristics of school administrators, and school policies and practices. The seven questionnaires of the SASS are as follows:

1. The Teacher Demand and Shortage Questionnaire for Public School Districts (LEAs).
2. The Teacher Demand and Shortage Questionnaire for Private Schools.
3. The School Administrator Questionnaire.
4. The Public School Questionnaire.
5. The Private School Questionnaire.
6. The Public School Teachers Questionnaire.
7. The Private School Teachers Questionnaire.

Sample Selection

All 56,242 public and 11,529 private school teachers in the teacher samples were selected from the 9,317 public and 3,513 private school samples.[8]

A list which included all full-time and part-time teachers, itinerant teachers, and long-term substitutes was obtained from each sample school. Within each school, teachers were stratified by experience; one stratum included new teachers, and a second stratum included all other teachers. New teachers were those who, counting the 1987-88 school year, were in the first, second, or third year of their teaching career in either a public or private school system. Within each teacher stratum, teachers were sorted by subject (General Elementary Education, Special Education, Mathematics, Science, English,.Social Science, Vocational Education, other).

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[8] The other SASS samples were as follows: 5594 public school districts, and the administrators (principals) of schools in the public and private school samples.

The public and private school teacher samples was designed to include a basic sample and a Bilingual/ESL(English as a Second Language) supplement. The bilingual/ESL supplement included teachers who use a native language other than English to instruct students with limited English proficiency (bilingual) and teachers providing students with limited English proficiency with intensive instruction in English (ESL). The supplement was funded by the Department of Education's Office of Bilingual Education and Minority Language Affairs (OBEMLA) in order to obtain more reliable estimates of bilingual/ESL education teachers.

The basic sample of teachers required for each of the public and private school strata was allocated to the sample schools in each stratum so that the teacher weights were equal. The specified average teacher sample size for each sample school (4, 8, and 6 teachers for each public elementary, secondary, and combined school, respectively; and 4, 5, and 3 teachers for each private elementary, secondary, and combined school, respectively) was then allocated to the two teacher strata to obtain an oversampling of new private school teachers at a fixed rate, and proportional allocation of public school teachers. Finally, a systematic sampling scheme was then applied to select the basic sample within each teacher stratum. An independent systematic sampling scheme was applied to bilingual teachers in each sample school to select the bilingual supplement. To control the number of teachers in each of the six bilingual strata (California, Texas, Florida, Illinois, New York, and all other States), the supplement was subsampled systematically with equal probabilities by stratum. Teachers selected in both the supplement and the basic sample were unduplicated so that each teacher appears only once.

The sample sizes were as follows:

-Public nonbilingual	53,394	-Private nonbilingual	11,248
-Public bilingual	2,848	-Private bilingual	281

Data Collection

The Teachers Questionnaires were mailed to the sampled schools in February 1988. Approximately 10 days after this mailout, a letter was sent to the survey coordinator in each school identifying the school's sample teachers and requesting the coordinator to remind the sample teachers to complete and return their questionnaires. Approximately six weeks after the mailout, a second set of questionnaires, for sample teachers who had not returned the first questionnaire, was sent in a package to the school coordinators for distribution to nonresponding teachers. During the time of this second mailout, each coordinator was telephoned and asked to remind those teachers who had not returned the first questionnaire to complete the second one and mail it back. A telephone follow-up was conducted during April, May, and June. Due to the large number of nonrespondents and the necessity for completing the follow-up prior to the closing of schools for the summer, only a subsample of nonresponding teachers was included in this effort. This subsample of nonresponding teachers had their weights adjusted to represent the nonresponding teachers who were not selected for the followup.

Questionnaire Response Rates

Weighted response rates were 86.4 percent for the Public School Teachers Questionnaire and 79.1 percent for the Private School Teachers Questionnaire.

Item Description

The Public and Private School Teachers Questionnaires are almost identical, and are available from NCES and/or the author.

Effects of Item Nonresponse

There was no explicit imputation for item nonresponse. Not imputing for item nonresponse leads to a bias in the estimates. In tables which present averages, the nature of this bias is unknown.

Standard Errors

The estimates in these tables are based on samples and are subject to sampling variability. Standard errors were estimated using a balanced repeated replication procedure that incorporates the design features of this complex sample survey. The standard errors provide indications of the accuracy of each estimate. If all possible samples of the same size were surveyed under the same conditions, an interval of 1.96 standard errors below to 1.96 standard errors above a particular statistic would include the universe value in approximately 95 percent of the cases. Note, however, that the standard errors in the tables do not take into account the effects of biases due to item nonresponse, measurement error, data processing error, or other systematic error.

Definition of Teacher

For purposes of this survey, a teacher was any full-time or part-time regular teacher whose primary assignment was teaching in any teaching field in any grade K-12. Itinerant teachers were included, as well as long-term substitutes who were filling the role of a regular teacher on an indefinite basis.

For More Information

For information about purchasing SASS data tapes on public and private school teachers, call Information Services, Office of Education Research and Improvement, U.S. Department of Education (1-800: 424-1616).

For more information about these technical notes, contact Sharon A. Bobbitt, Elementary and Secondary Education Statistics Division, National Center for Education Statistics, U.S. Department of Education, 555 New Jersey Avenue N.W., Washington, D.C., 20208-5651, telephone (202) 219-1416.

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